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ABSTRACT

This statistical review is the second in a biennial series mandated by Public Law 96-516. This report, which provides a comprehensive overview of the participation of women and minorities in science and engineering (S/E) employment and training, is divided into three chapters. The first chapter focuses on the representation of women and minorities in S/E employment and differences in employment characteristics between sex and racial groups independent of the overall employment levels. The second chapter considers measures that indicate underutilization of those with scientific and engineering skills, with particular attention to differences between the sexes or among racial/ethnic groups. The third chapter examines the acquisition of scientific and engineering skills, highlighting differences in academic coursework, performance on achievement tests, and undergraduate and graduate degree production. Data within each chapter are presented first for women and then for racial minorities and Hispanics. The physically handicapped in science and engineering are also considered in the first chapter. Among the findings reported are those indicating that despite substantial gains over the past decade, women and minorities are still underrepresented in S/E employment and training, and that their rates of participation in precollege science and mathematics courses and in undergraduate and graduate S/E education are lower than those of men. The appendix includes 77 statistical tables. (JN)

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Women and Minorities in Science and Engineering

National Science Foundation
January 1984

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Foreword

An important feature of U.S. public policy is the broadest utilization of the country's human resources. Full participation of women and minorities in scientific and technological activities is a significant component of this policy. An accurate picture of the current situation and recent trends is necessary for the development of programs designed to achieve these goals. Consequently, the National Science Foundation has for many years generated and published data on the training and employment of women and minority scientists and engineers.

In 1982, in conformance with the Science and Technology Equal Opportunities Act (Public Law 96-516), the Foundation issued the first special biennial statistical report on women and minorities in science and technology. This is the second publication in this series, which provides a factual basis for informed debate and constructive policy and program development.

Edward A. Knapp

Edward A. Knapp
Director
National Science Foundation

Acknowledgments

This report was developed within the Division of Science Resources Studies by Michael F. Crowley, Senior Staff Associate for Methods and Analysis, Scientific and Technical Personnel Studies Section (STPSS), with the assistance of Melissa J. Lane. Contributions to the overall development of the report were provided by John A. Scopino and Nancy M. Conlon (STPSS). The report also benefited from useful comments provided by external reviewers and the National Science Foundation's Committee on Equal Opportunities in Science and Technology.

Guidance and review were provided by Alan Fechter, former Head, and Charles H. Dickens, Acting Head, Scientific and Technical Personnel Studies Section; Charles E. Falk, Director, Division of Science Resources Studies; and Richard J. Green, Assistant Director of NSF for Scientific, Technological and International Affairs.

Contents

Executive Summary vii

Introduction xi

Chapter 1. EMPLOYMENT OF WOMEN AND MINORITIES IN SCIENCE AND ENGINEERING 1
  Women in Science and Engineering 1
    Employment Levels and Trends 1
    Field 2
    Years of Experience 2
    Career Patterns 5
    Minority Women By Race 8
  Racial Minorities in Science and Engineering 9
    Employment Levels and Trends 9
    Field 9
    Years of Experience 11
    Career Patterns 11
  Hispanics in Science and Engineering 12
    Employment Levels 12
    Field 13
    Years of Experience 13
    Career Patterns 13
  Physically Handicapped in Science and Engineering 14

Chapter 2. LABOR MARKET INDICATORS 17
  Women Scientists and Engineers 17
    Labor Force Participation Rates 17
    Unemployment Rates 18
    S/E Employment Rates 19
    S/E Underemployment Rates 20
    S/E Underutilization 20
    Minority Women By Race 21
  Racial Minority Scientists and Engineers 21
    Labor Force Participation Rates 21
    Unemployment Rates 21
    S/E Employment Rates 22
    S/E Underemployment Rates 23
    S/E Underutilization 23
  Hispanic Scientists and Engineers 23
    Labor Force Participation Rates 23
    Unemployment Rates 23
    S/E Employment Rates 23
    S/E Underemployment Rates 24
    S/E Underutilization 24

Chapter 3. EDUCATION AND TRAINING 25
- Women 25
  - Precollege Preparation 25
    - Curriculum and Coursework 25
    - Mathematics and Science Achievement 28
    - Characteristics of College-Bound Seniors 29
    - Precollege Summary 31
  - Undergraduate Preparation 31
  - Earned Degrees 31
  - Graduate Degree Attainment Rates 32
  - Graduate Support Status 33
  - Postdoctoral Appointments 33
- Racial Minorities 34
  - Precollege Preparation 34
    - Curriculum and Coursework 34
    - Mathematics and Science Achievement 35
    - Characteristics of College-Bound Seniors 36
    - Precollege Summary 38
  - Undergraduate Preparation 39
  - Earned Degrees 40
  - Graduate Support Status 40
  - Postdoctoral Appointments 41
- Hispanics 41
  - Precollege Preparation 41
    - Curriculum and Coursework 41
    - Mathematics and Science Achievement 42
    - Characteristics of College-Bound Seniors 42
    - Precollege Summary 43
  - Undergraduate Preparation 43
  - Earned Degrees 44
  - Graduate Support Status 44

TECHNICAL NOTES 47

APPENDIX TABLES 53

Executive Summary

This report, the second in a biennial series mandated by Public Law 96-516, presents information on the participation of women, racial/ethnic minority group members, and the physically handicapped in science and engineering. In keeping with its purpose as an information resource, this report makes no recommendations on programs or policies; rather, it discusses issues of interest to policymakers and others concerned with the full use of the Nation's resources in science and engineering.

Despite substantial gains over the past decade, women and minorities are still underrepresented in science and engineering, both in employment and in training. Their rates of participation in precollege science and mathematics courses and in undergraduate and graduate science and engineering (S/E) education are lower than those of men and the majority. Women and minorities who earn degrees in S/E fields generally have higher rates of unemployment and lower average salaries than their counterparts. These and other differences noted in the report can reflect differences in sociodemographic characteristics (such as years of work experience), differences in career preferences, or a combination of such factors. They may also reflect inequitable treatment.

One of the dramatic features of the last decade has been the trend for more women to select education programs leading to S/E degrees. Women received 37 percent of S/E bachelor's degrees granted in 1981, up from 27 percent in 1971. At the doctorate level, women earned 23 percent of the S/E degrees granted in 1982, compared with 11 percent 10 years earlier.

The greater number of women and minority S/E degree recipients has made possible the growth of these groups in S/E employment. Once they have obtained their degrees, however, women and minorities are more likely than their counterparts to be unemployed (although their rates are still relatively small compared with those experienced by the overall U.S. work force). Women and minority scientists and engineers who are employed are less likely to hold jobs in science and engineering, although more than 80 percent do hold such positions. In addition, the salaries of women and blacks range from 20 percent to 10 percent below those of their male and white counterparts.

Because of the increasing proportion of S/E degrees being earned by women and minorities, there is less disproportionate representation among the younger members of these groups. If this growth trend continues, it is likely that differences in employment representation will decrease. The greater proportions of women among S/E degree recipients is causing a shift in concern from access to S/E education and training to career advancement in S/E fields. Among minorities, the fundamental concern continues to be participation in precollege science and mathematics coursework—a necessary precursor to increased attainment of S/E degrees.

Females and minorities take fewer years of mathematics and science in high school than do males and the majority and have lower scores on standardized tests such as the Scholastic Aptitude Test (SAT). Differences in test scores between females and males, however, are smaller than those between racial/ethnic minorities and the majority.

Although efforts were made to develop data on scientists and engineers with physical handicaps, many respondents did not answer questions about handicap status in the surveys underlying the data in this report. The best estimate is that about 2 to 3 percent of all scientists and engineers have a physical handicap.

The major findings emerging from available data on women, racial minorities, Hispanics, and the physically handicapped are summarized below.

WOMEN

Employment

- Employment of women scientists and engineers increased by over 200 percent between 1972 and 1982, compared with about 40 percent for men. As a result, in 1982, women accounted for 13 percent of the S/E work force, roughly double their representation in 1972. However, this level was still considerably below women's representation among more aggregated groups; they represented 45 percent of both total U.S. and all professional and related worker employment.
- Representation of women varies substantially by field. For example, one in every four scientists but less than one in every twenty engineers was a woman in 1982. Within the sciences, the representation of women ranged from 12 percent of environmental and physical scientists to 45 percent of mathematical scientists.
- There are differences in the characteristics of male and female scientists and engineers that can affect career patterns. Reflecting their more rapid increase in employment, almost two-thirds of the women compared with slightly over one-third of the men had less than ten years of professional experience in 1982. Furthermore, the female S/E work force was younger than the male: three-fifths of the women but only one-third of the men were under 35 years of age.

- Only one-fifth of the women compared with one-third of the men cited management or administration as their primary activity, a statistic that reflects in part their fewer years of professional experience. Furthermore, within educational institutions, women were less likely than men to hold tenure or be in tenure-track positions.

- Annual salaries for women scientists and engineers averaged almost 80 percent of those for men, about the same differential as in 1972. This differential remained after controlling for the differences in S/E field distributions between women and men. The salary differences were less for younger scientists and engineers.

- About 80 percent of the employed women scientists and engineers were working in S/E jobs in 1982; the comparable figure for men was about 90 percent. Among those holding doctorates, roughly 90 percent of both women and men held S/E jobs.

- The unemployment rate for women scientists and engineers was about twice that for men in 1982 (4.3 percent vs. 2.0 percent), and the rates for women were higher across all major fields.

- Statistical indicators derived from available data suggest greater underutilization of women than men in science and engineering. If those who are (a) unemployed involuntarily, (b) working involuntarily in part-time jobs, and (c) working involuntarily in non-S/E jobs are considered as a proportion of the total, one finds that about 9 percent of women compared with 3 percent of men are underutilized in science and engineering.

- Labor market indicators, such as labor force participation and S/E employment rates, for women scientists and engineers vary in a fairly narrow range by race. For women S/E's, differences by race are less than the differences by sex within all racial groups. Hence, it appears that gender is a more significant factor than race in the labor market behavior of minority women in S/E fields.

Education and Training

- With respect to precollege preparation, females and males are equally likely to be enrolled in academic programs in high school, but males take substantially more courses in mathematics (including honors courses) and science. This difference is reflected in scores on standardized tests of mathematics and science achievement: while females have slightly higher scores than males at younger ages (9-year-olds), males score significantly higher among 17-year-olds.

- Scores for females on the mathematics component of the Scholastic Aptitude Test (SAT) are well below those for males (443 vs. 493). When stratified by intended undergraduate major, males who planned to major in a natural science field scored higher on the mathematical component than did females. Among prospective engineering students, however, mathematics test scores for females were higher than those for males. On the Graduate Record Examination (GRE), scores for men and women were roughly similar on the verbal and analytical portions of the test, but men scored higher than women on the quantitative component.

- Women earned about 37 percent of the S/E bachelor's degrees awarded in 1981, up from 26 percent in 1970, but earned one-half of all undergraduate degrees in 1981. By S/E field, the share of degrees awarded to women in 1981 ranged from 52 percent in the social sciences to 11 percent in engineering.

- At the doctorate level, women earned 23 percent of the S/E degrees granted in 1982, up from 11 percent a decade earlier. The proportion of new women doctorates in 1982 was greatest in psychology (45 percent) and least in engineering (5 percent).

RACIAL MINORITIES

Employment

- In 1982, blacks accounted for 2.6 percent of all employed scientists and engineers, but over 9 percent of total U.S. employment and over 6 percent of all professional and related worker employment. Asians, on the other hand, represented 4.5 percent of the employed scientists and engineers but only about 1.6 percent of the overall U.S. labor force.

- The representation of native Americans is about the same among scientists and engineers as in the overall U.S. work force. Data on native Americans, however, should be viewed with caution since they are based on an individual's perception of his or her native American heritage; such perceptions may change over time.

- Racial minorities are concentrated in different fields of science and engineering than are their white colleagues. Asians (two-thirds) and whites (over one-half) are more likely than blacks (almost one-half) to be engineers rather than scientists. Among those who are scientists, blacks are more likely than whites to be social scientists, while whites and Asians are more likely than blacks to be computer specialists.

- The unemployment rate for black S/E's in 1982 (4.6 percent) was more than twice that for whites (2.1 percent). Unemployment among Asians averaged 3.3 percent; among native Americans, it averaged about 1 percent.

- Racial minorities are younger than whites and have fewer years of professional experience. Almost two-fifths of the white scientists and engineers in 1982 reported fewer than ten years of professional experience, compared with almost one-half of the blacks and over two-fifths of the Asians. Partially reflecting their fewer years of professional experience, minorities are somewhat less likely than whites to be primarily engaged in management. In 1982, 25 percent of the whites cited management as their primary activity. Blacks (23 percent) were almost as likely as whites and more likely than Asians (18 percent) to be in management or administration.

- Underutilization for scientists and engineers varies by race. Almost 8 percent of the black S/E's were either unemployed working involuntarily in part-time jobs, or working in non-S/E jobs, as compared with 4 percent of white and 5 percent of Asian S/E's.
- On average, black scientists and engineers earn lower salaries than whites, Asians, or native Americans. In 1982, average annual salaries were about $30,000 for blacks but about $34,000 for other races. The gap between black and white salaries remains after controlling for the differences in S/E fields between whites and blacks.

Education and Training

- Whites and Asians scored consistently higher than blacks and native Americans on the SAT over the 1976-82 period. The largest differentials were on the mathematics component of this test. In 1982, blacks scored 117 points lower than whites (366 vs. 483), while scores for native Americans were 59 points lower (424). Asians scored consistently higher than whites on the mathematics component; in 1982, their average score was 513, 30 points higher than for whites.
- Blacks earned 6 percent of the S/E bachelor's degrees and about 2 percent of the S/E doctorates. By S/E field at the bachelor's level, the share of degrees awarded to blacks ranged from less than 4 percent in engineering to more than 8 percent in the social sciences. However, blacks accounted for 10 percent of overall undergraduate enrollments and 5 percent of graduate enrollments. Native Americans earned about 0.4 percent of the S/E bachelor's degrees and accounted for 0.7 percent of the total undergraduate enrollment.

HISPANICS

Employment

- Hispanics in 1982 represented almost 5 percent of all employed persons, almost 3 percent of all professional and related workers, and slightly over 2 percent of all scientists and engineers.
- Among Hispanic S/E's, almost three-fifths were engineers rather than scientists, roughly similar to the overall engineer-scientist split. Among scientists, Hispanics were somewhat more likely than all scientists to be social scientists and less likely to be computer specialists or physical scientists.
- In 1982, almost half of the Hispanic S/E's had fewer than ten years of professional experience; among all S/E's, the comparable figure was two-fifths.
- Annual salaries for Hispanic scientists and engineers averaged about 90 percent of those for all S/E's ($31,500 vs. $34,100) in 1982.
- Hispanic scientists and engineers were more likely than non-Hispanics to be underemployed; that is, working involuntarily in a part-time job or working in a non-S/E job.

Education and Training

- A much smaller proportion of Hispanics than all high school seniors are in academic curriculums, and those who are take fewer mathematics and science courses. This difference is reflected in the fact that Hispanic "college-bound" seniors scored below all college-bound seniors on the mathematics component of the SAT.
- Hispanics earned about 2.5 percent of the S/E bachelor's degrees awarded in 1981, up slightly since 1976. At the doctorate level, they earned 1.6 percent of the S/E degrees granted in 1981.

PHYSICALLY HANDICAPPED

- Almost 2.5 percent, or about 65,000, of all scientists and engineers reported a physical handicap in 1982. Of these, 28 percent reported an ambulatory handicap, 23 percent had a visual handicap, and about 18 percent reported an auditory handicap; the remaining 30 percent did not specify the nature of their handicap. Given the high rates of non-response to questions relating to handicap status in the surveys underlying this report, the data should be used with caution.
- Those S/E's reporting handicaps are much more likely than all scientists and engineers to be out of the labor force. In 1982, almost 20 percent of those reporting a physical handicap compared with only 5 percent of all scientists and engineers were neither working nor seeking employment.

Introduction

This report, the second in a biennial series mandated by Congress (Public Law 96-516), provides a comprehensive statistical overview of the participation of women and minorities in science and engineering employment and training. The legislation mandating this report reflects Congressional concern that inadequate levels of participation by these groups in science and engineering may result in underutilization of scarce human resources.

In the empirical analyses, statistics indicating the level and nature of participation are compared to determine whether disparities exist. Comparisons between women or minorities in science and engineering and comparable groups at more aggregate levels (e.g., all college graduates or all professional workers) are made to ascertain relative levels of participation. Additional comparisons between men and women scientists and engineers and between minorities and the majority are drawn to determine whether differences exist in employment opportunities and, for those employed, whether there are differences in utilization.

Although disparities may indicate inequitable treatment, these disparities by themselves may not be sufficient to justify an inference of inequity. Observed disparities may also reflect differences in sociodemographic characteristics (such as amount of work experience), differences in career preferences, or a combination of such factors which include or are byproducts of inequitable treatment.

The report is organized around three themes. The first chapter discusses the utilization of human resources with scientific and engineering skills, including the share accounted for by women and minorities and differences between groups in career patterns and salaries. The second chapter considers measures that indicate underutilization of those with scientific and engineering skills, with particular attention to differences between sexes or among racial/ethnic groups. The third chapter examines the acquisition of scientific and engineering skills, highlighting differences in academic coursework, performance on achievement tests, and undergraduate/graduate degree production.

The report has been developed as a reference document and is designed so that the reader may easily locate information on particular subgroups or on particular aspects of participation or utilization. Those preferring a more concise overview of the findings are encouraged to review the Executive Summary.

Data within each chapter are presented first for women and then for minorities, an order that reflects only the availability of more statistically reliable data for women. In developing the surveys underlying most of the employment and labor market data on scientists and engineers in this report, the National Science Foundation placed emphasis on increasing sample sizes for women and minorities. Thus, the 1982 data on employment and related areas for women and minorities presented herein are generally more statistically reliable than the data presented in the first report (NSF 82-302). In addition, more statistically reliable data are now available for some groups—specifically, minority women, native Americans, and Hispanics—than was previously the case.

The timing of this report provides a unique opportunity to exploit a comprehensive data base: the 1982 Postcensal Survey of Scientists and Engineers, which is conducted only once every decade. Comparisons with like data from the 1972 Postcensal Survey provide insights into long-term trends in the participation of women and minorities in science and engineering. Since the technical evaluation and analysis of statistics derived from the 1982 Postcensal Survey will not be completed by the time this report is published, only preliminary 1982 data are included.

Much of the information presented in this report is derived from sample surveys and is therefore subject to sampling limitations and to incomplete or inaccurate responses. Because of the relatively small number of women and minorities in science and engineering, data for these groups are not as statistically reliable as those for men and whites. However, any comparisons between women and men and between minorities and the majority that are made are generally statistically significant at least to the 0.05 confidence level; that is, the reported difference is due to chance only 5 or fewer times in 100.

Information pertaining to the statistical reliability of much of the data in this report may be found in the Technical Notes. There are some differences in concepts, data collection techniques, and reporting procedures among the statistics presented. Primary data sources listed in the references, Technical Notes, and statistical tables will provide full information on these technical aspects and on the limitations of the statistics.

Employment of Women and Minorities in Science and Engineering

This chapter focuses on two broad topics: (1) the representation of women and minorities in science and engineering (S/E) employment; and (2) differences in employment characteristics between sex and racial groups independent of the overall employment levels. It is important to realize that policy implications of underrepresentation are different from policy implications of differences in employment characteristics.

Representation in the labor market can be assessed by comparing the proportion of employed scientists and engineers who are women or members of racial or ethnic minority groups with the proportion of these groups in some relevant population, generally all professional, technical, and related workers. The level of representation, however, reveals nothing about the experiences of women and minorities once they are in the labor market. It is also necessary to have information about the nature of their involvement in the labor market, such as type of work activity (managerial or nonmanagerial). Observed differences between the experiences of women and minorities in science and engineering and men and the majority can highlight potential areas of concern. These differences may reflect (1) differences in field, work experience, or sector of employment; (2) differences in workers' decisions about the nature of their work involvement; (3) differences in employer personnel practices in areas such as hiring, training, and promotion; or (4) some combination of these factors.

This chapter examines labor market experiences of scientists and engineers in terms of field of employment and career patterns. Information on field of employment is valuable for at least two reasons: first, it indicates whether women and minorities are underrepresented in some fields vis-a-vis men and the majority; second, it reveals field differences by sex and racial/ethnic group. Since employment opportunities vary by field, field differences may be significant in determining differences in such work characteristics as employment in science and engineering jobs, unemployment, and salaries—characteristics that are frequently used as indicators of labor market experiences. Measures such as proportions in management positions and, for those employed in academia, tenure status and rank may be indicators of career development.

The data in this chapter (and in chapter II) on scientists and engineers at all degree levels are based largely on the results of three sample surveys which are aggregated to produce overall national totals. These surveys are the 1982 Postcensal Survey (scientists and engineers in the labor force at the time of the 1980 Census of the Population), the Survey of Doctorate Recipients (scientists and engineers holding doctorates), and the New Entrants Survey (recent science and engineering graduates from U.S. universities).

Generally, data are presented for all scientists and engineers and for those holding doctoral degrees. Data for recent S/E graduates are also presented, since the experience of recent S/E graduates can be a sensitive barometer of changing labor market behavior. Any changes in employer decisions are normally reflected first in hiring actions. Furthermore, because recent graduates constitute the major source of new supply for the S/E labor market, their experiences may provide a leading indicator of future changes in the characteristics of employed scientists and engineers.

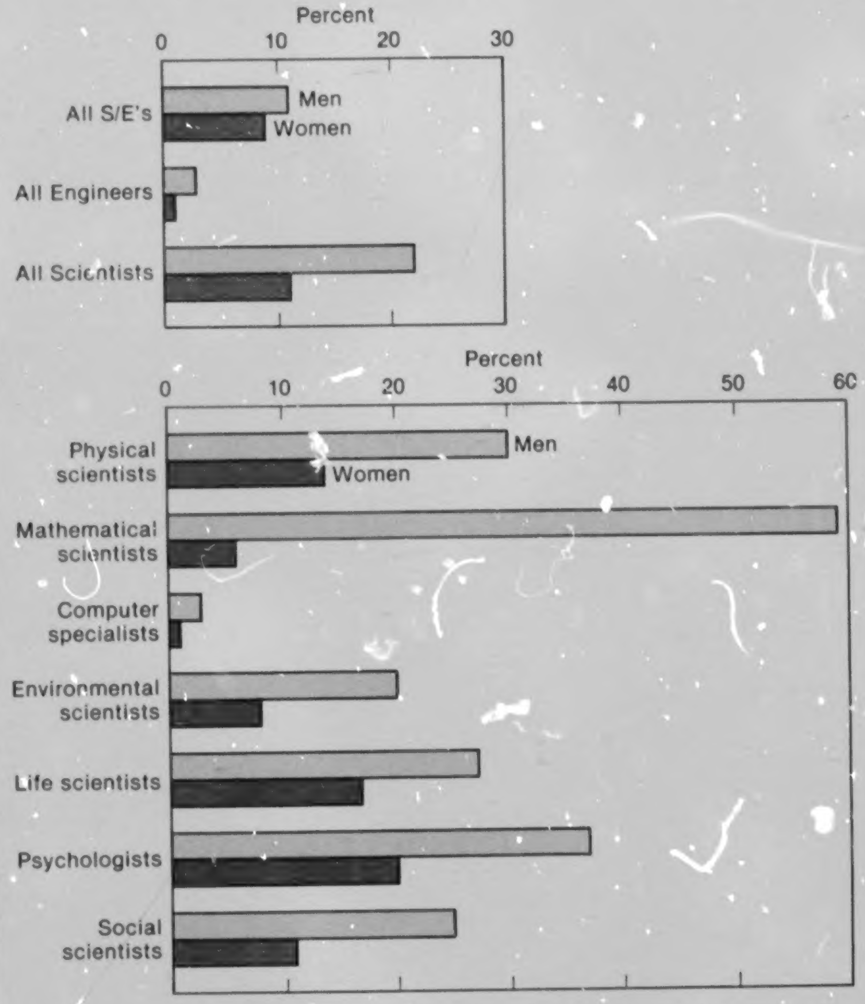
WOMEN IN SCIENCE AND ENGINEERING

Employment Levels and Trends

Women continue to be underrepresented in science and engineering. In 1982, women represented about 13 percent of all employed scientists or engineers but about 45 percent of both all employed persons and all professional and related workers.[1] This underrepresentation persists despite significant employment gains over the 1972-82 decade, a period in which employment of women scientists and engineers grew by over 200 percent (with employment of engineers increasing more rapidly than that of scientists), while employment of men increased by about 40 percent. Since 1972, the proportions of all employed scientists and engineers who are women roughly doubled, in line with the general trend toward greater participation of women in the work force. Between 1972 and 1982, employment of women in all occupations increased by almost 40 percent, compared with about 10 percent for men. Among professional and related workers, the number of women increased by almost 70 percent, while employment of men was up 33 percent.

Educational attainment, particularly holding a doctorate, affects a number of employment-related variables. Women scientists, on average, were half as likely as male scientists to hold doctorates. Among employed female scientists, about 11 percent held doctorates; for men, the comparable figure was 22 percent. Differences by gender in the propensity to hold doctorates vary by field, with the largest differences found among mathematical and environmental scientists. Among engineers, about 3 percent of the men and

Figure 1-1. Proportion of employed scientists and engineers with doctorates by field and sex



NOTE: Based on 1981 data for doctoral scientists and engineers and on 1982 data for all scientists and engineers.

SOURCES: Based on Appendix tables 1 and 5.

1 percent of the women hold doctorates (figure 1-1).

Employment of scientists and engineers holding doctorates has been increasing more rapidly among women than men. Between 1973 and 1981, employment of women doctoral S/E's increased from 17,000 to 41,000, or about 140 percent, while employment of men rose from 203,000 to almost 303,000, about 50 percent. More recently, between 1979 and 1981, employment of women increased 23 percent, compared with only 8 percent for men. The 41,000 employed women doctoral scientists and engineers in 1981 represented about 12 percent of all doctoral S/E's, up from 8 percent in 1973.

Field

Women are more likely than men to be scientists rather than engineers, and within the sciences, women are concentrated in different fields than men.[2] In 1982, women represented almost 25 percent of all scientists but only about 3.5 percent of all engineers. The representation of women among science fields ranged from around 12 percent of all environmental and physical scientists to about 46 percent of all mathematical scientists (figure 1-2).

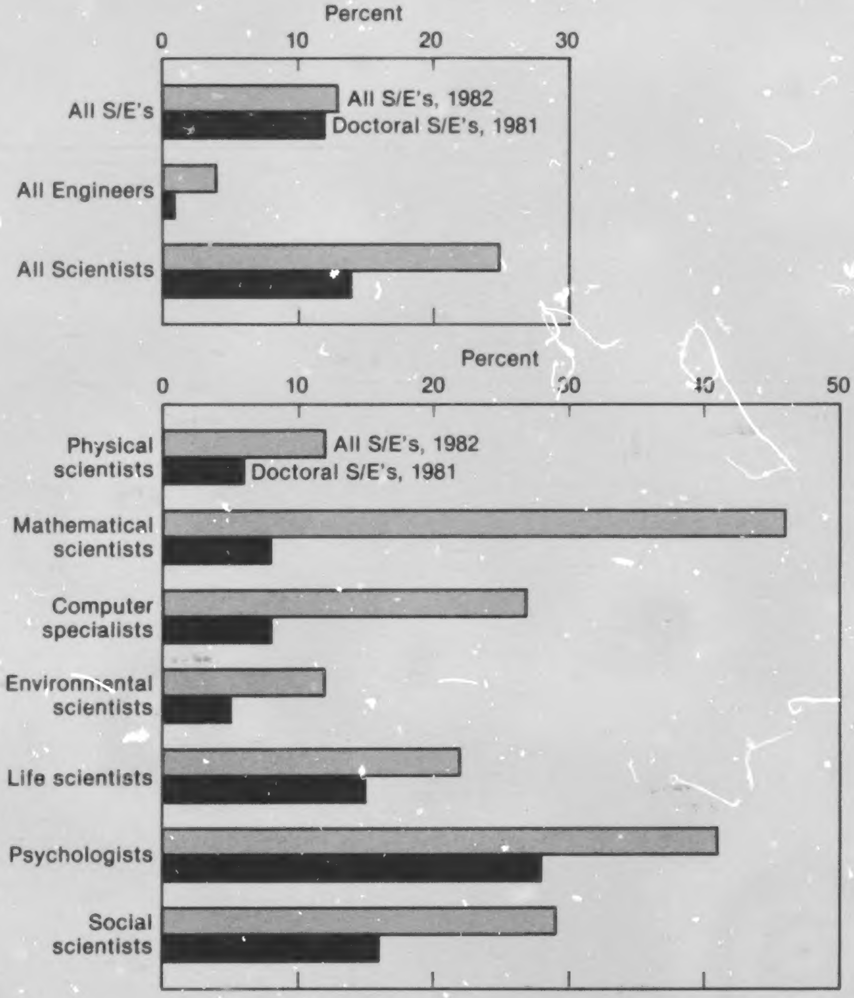
Women with doctorates are concentrated in the life and social sciences and psychology while male Ph.D.'s are more likely to be life or physical scientists and engineers. Among women, the fastest growing fields at the doctoral level were engineering, where employment of women increased from 100 in 1973 to 800 in 1981, and computer specialties, where the rise was from 100 to 700 over the same period. Despite rapid growth in these fields, only about 2 percent of the women holding doctorates were computer specialists or engineers in 1981. Over 80 percent of the increase in employment of women doctoral S/E's took place in three major fields: life sciences, psychology, and social sciences. Over the 1973-81 period, the field distribution of women doctoral S/E's changed slightly: women were more likely to be social scientists and psychologists, and less likely to be life and physical scientists, in 1981.

The field distributions of employed female and male scientists and engineers are shown in figure 1-3. An "index of dissimilarity" (a summary measure of overall differences between two distributions) can be used to quantify field differences between two groups.[3] Among male and female scientists and engineers, the 1982 index of dissimilarity was 48. This statistic means that 48 percent of the women would have to change fields or occupations to have a distribution identical to that of men. If engineers are eliminated from the analysis, the difference narrows and the index falls from 48 to 25. Differences between sexes in the field distribution for doctoral scientists were larger than the differences for scientists at all educational levels combined. The index of dissimilarity for doctoral scientists was 30 in 1981, compared with 25 for those at all degree levels.

Years of Experience

Years of professional experience influence a number of employment- and

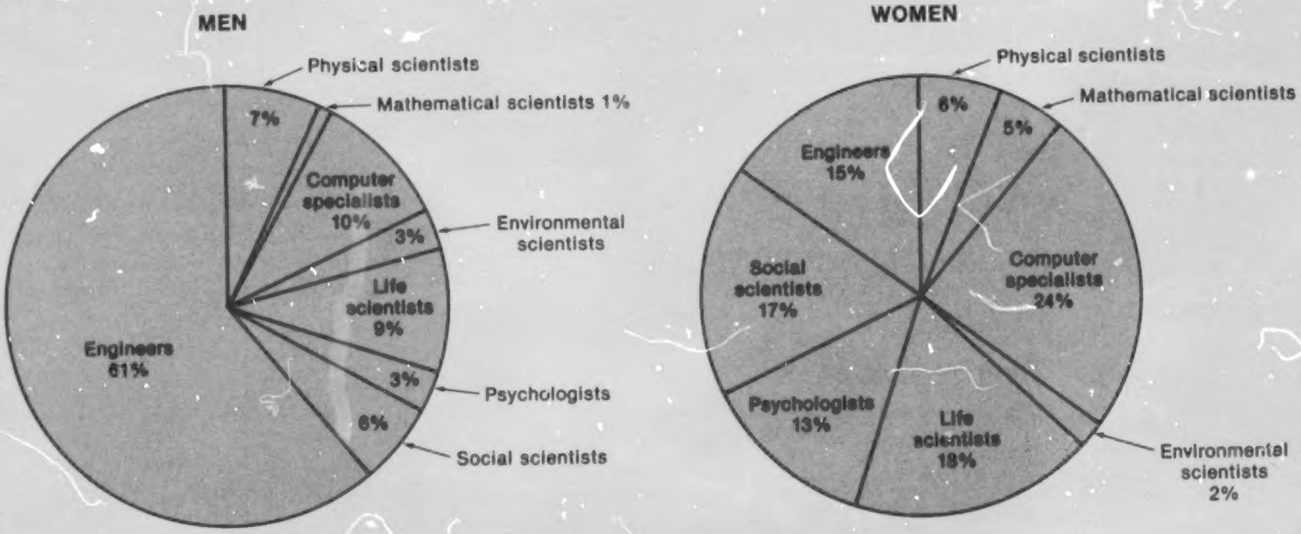
Figure 1-2. Employed women as a percent of total employed



SOURCES: Based on Appendix tables 1 and 5.

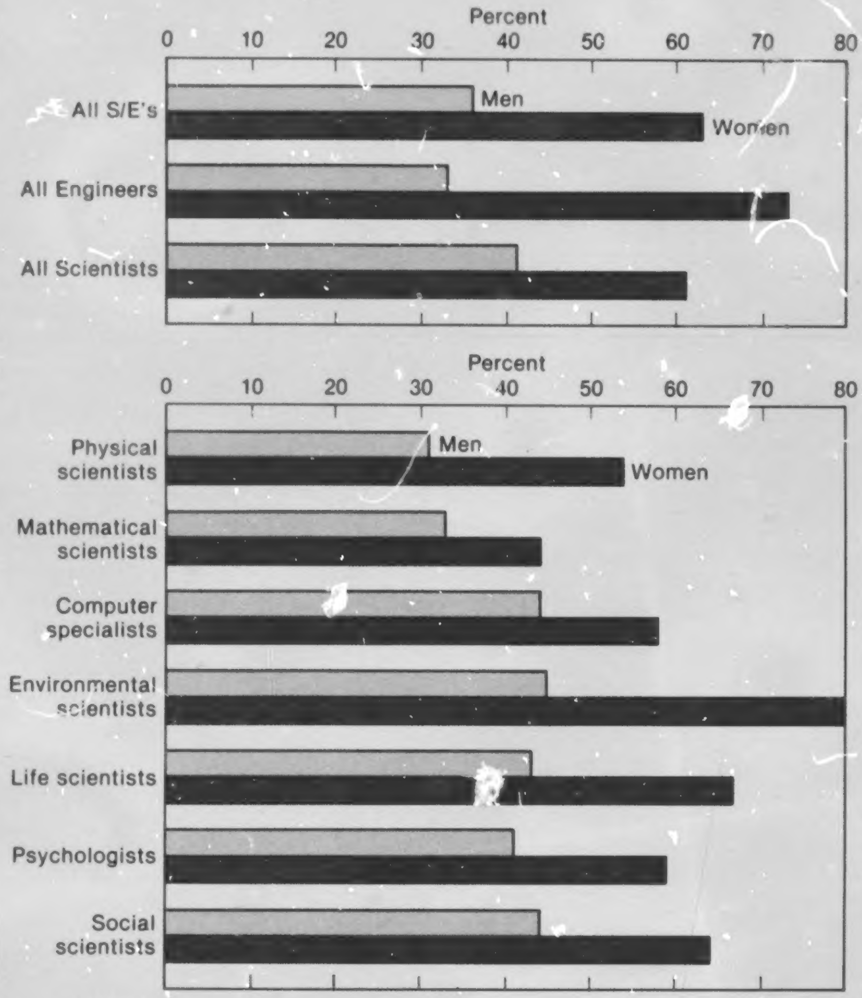
13

Figure 1-3. Employed scientists and engineers by sex and field: 1982



SOURCE: Based on Appendix table 1.

Figure 1-4. Proportion of S/E's with less than ten years of professional experience by field and sex: 1982



SOURCE: Based on Appendix table 32.

labor-market related variables, including the propensity to hold management assignments, tenure status and academic rank, and salaries. Because of more rapid increases in the employment of female compared with male S/E's, women are, on average, younger than their male counterparts and have fewer years of professional experience. In 1982, over three-fifths of the employed women S/E's reported less than ten years of professional experience and almost two-fifths reported less than five years of such experience. Comparable figures for men were about one-third and less than one-fifth, respectively.

Years of professional experience reported by both men and women vary across fields of science and engineering. These variations reflect not only differential growth rates by field, but also the movement of women into fields historically dominated by men. For example, about one-third of the male engineers reported fewer than ten years of experience; among women engineers, the comparable figure was about three-fourths (figure 1-4).

At the doctoral level, women report significantly fewer years of professional experience than men.[4] In 1981, about 60 percent of the women but only 35 percent of the men had less than ten years of professional experience. Furthermore, over twice as many doctoral women, proportionally, as men had less than five years of professional experience (33 percent vs. 15 percent). As with all S/E's, years of professional experience at the doctoral level vary by field.

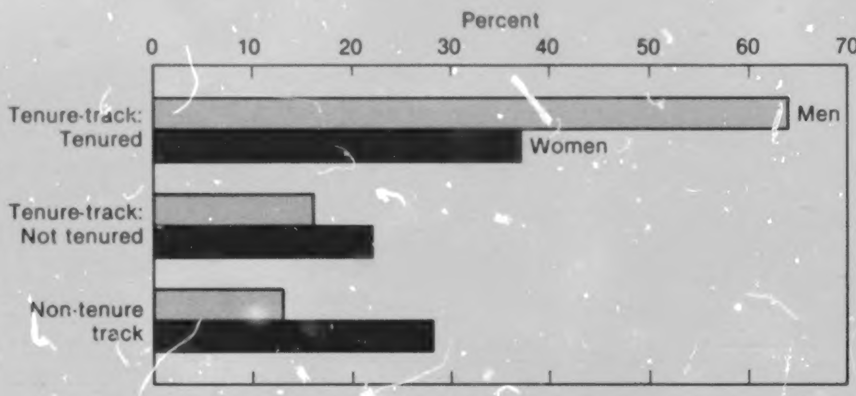
Career Patterns

Although direct indicators of career development do not exist, information on some specific career-related activities, especially the number and proportion of women primarily engaged in management activities, is available. In academia, tenure status and faculty rank can be indicators of career progression. Finally, salary comparisons can serve as a rough proxy for career progression or promotional opportunities.

Given that women scientists and engineers are younger and generally have fewer years of professional experience than men, it is not surprising that men are almost twice as likely as women to report management as their primary activity. In 1982, 15 percent of the women and 27 percent of the men reported management as their major activity. The proportion of female S/E's in management increased since the early 1970's, while the proportion of men remained relatively constant. In the early seventies, men were three times as likely as women to be in management or administration. Furthermore, the propensity to be in management in 1982 varied by field and between scientists and engineers, with men more likely than women to be in management across major fields. Among scientists, 15 percent of the women and 25 percent of the men were managers or administrators in 1982. Among engineers, the comparable figures were 14 percent for women and 28 percent for men.

Within educational institutions, a smaller fraction of doctoral women scientists and engineers hold tenure or are in tenure-track positions (figure 1-5). Women are also less likely than men to hold professorial rank (i.e., professor, associate professor, or assistant pro-

Figure 1-5. Doctoral scientists and engineers in educational institutions by tenure status and sex: 1981



NOTE: Detail does not add to 100 because no report is not included. About 13 percent of the women and 7 percent of the men did not report tenure status.

SOURCE: National Science Foundation, unpublished data.

fessor), and if they hold professorial rank, they are less likely to be full or associate professors. In 1981, 88 percent of the doctoral women who were university or college teachers held professorial rank; for men, the comparable figure was 96 percent. Among those with rank, 80 percent of the men and 55 percent of the women were full or associate professors, with men more than twice as likely as women to hold full professorships. Sex differences in rank and tenure status were found to persist even when samples of women and men were matched for field, for the quality of the institution from which they received their doctorate, and for the number of years since receipt of the doctorate.[5]

Salaries—Male and female scientists and engineers earn different salaries, reflecting variations in field, education, experience, labor market behavior, employer behavior, or some combination of these factors.[6]

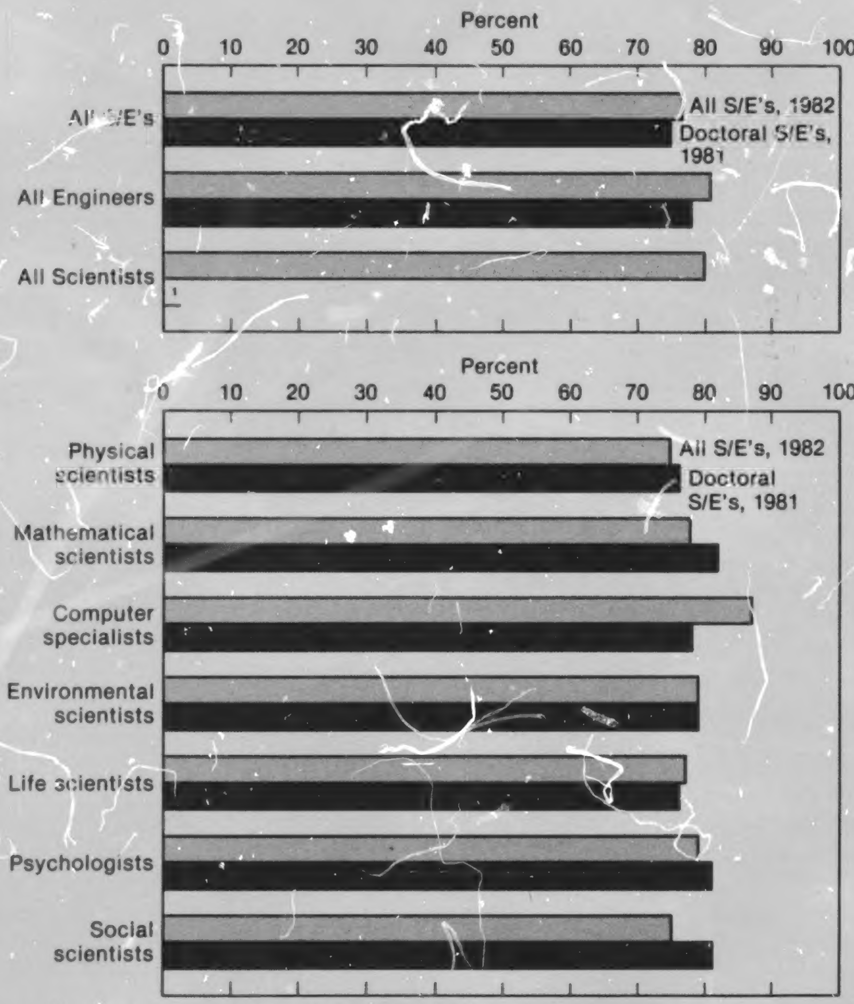
Female scientists and engineers, on average, earn lower salaries than male S/E's. In 1982, the average salary for women S/E's was about $27,000; for men, it was about $35,000. Women earn less than men across all major fields of science and engineering. Overall, women's salaries averaged almost 80 percent of men's. Differences in field distribution between women and men do not account for the differences in overall salaries. Controlling for field, salaries for women still average 80 percent of men's. By major field, women's salaries ranged from 75 percent of men's salaries among physical and social scientists to about 87 percent among computer specialists (figure 1-6). The female-male salary differential has not changed appreciably over time. In 1972, salaries of female scientists and engineers also averaged about 80 percent of those for their male colleagues. Salary differences between female and male scientists and engineers, however, are smaller than among all college graduates. In 1982, earnings of female college graduates averaged 66 percent of those of males.[7]

Women's salaries are below those for men across all age groups. The smallest salary differential in 1982 was for those scientists and engineers 25 to 29 years of age. In this group, women earned 90 percent of male salaries. Among the 25 to 29 year olds, women and men engineers reported roughly similar salaries ($28,400 for men vs. $27,800 for women). Among all scientists in this age group, salaries of women averaged 95 percent of those for men ($23,000 vs. $24,300). The differences in overall salaries in this age group reflect the fact that engineers generally earn higher salaries than scientists, and a relatively large number of men compared with women are engineers.

At the doctoral level as well, women earn less than men. Average salaries paid to women doctoral scientists and engineers in 1981 were 75 percent of those paid to men (figure 1-6). For all fields combined, the average annual salary for women with S/E doctorates was $26,800; the average for men was $35,600. Salaries for women doctoral scientists and engineers have increased more slowly than for men since the early seventies. Salaries for doctoral women increased by 56 percent between 1973 and 1981; for men, the increase was 70 percent. This pattern of lower women's salaries appears across all fields of science and engineering and across work activities and sectors of employment. After standardizing for field, race, sector of employment, and years of professional experience, the differential narrows, but almost half of the differential remains unexplained.[8]

Salary differentials also occur among recent (1980 and 1981) science and engineering graduates. In this group, female-male salary differentials were reported in 1982 at both the bachelor's and master's levels; differentials were also reported in 1981 for recent (1979 and 1980) doctorate recipients. Salary differentials became less pronounced with additional years of education, but they were not eliminated. Among science graduates, women earned 85 percent of male salaries; the differential was narrowest for life science graduates and widest for psychology graduates (appendix table 55). Women engineering graduates reported average salaries about $1,000 (4 percent) per year above those for men. At the graduate level, salary differentials between women and men are narrower than at the bachelor's level. In 1982, women master's degree holders earned, on average, about 84 percent of male salaries (86 percent for science graduates and 96 percent for engineering graduates). Among recent (1979 and 1980) recipients of doctoral degrees in science and engineering, women earned about 88 percent as much as men. Only among

Figure 1-6. Women's salaries as a percent of men's salaries by field



[1]Not available

SOURCES: Based on Appendix tables 50, 51, 53, and 54.

mathematical scientists did women earn more than men ($22,600 vs. $21,800, or 3.7 percent).

Minority Women By Race

The focus of the following discussion is on black, Asian, and native American women. Information on Hispanic women is presented in the following section on Hispanic scientists and engineers.

Employment Levels and Trends—Minority women represent a relatively small share of employed women scientists and engineers. Of the approximately 437,000 employed women scientists and engineers in 1982, about 85 percent were white, 7 percent were black, and 6 percent were Asian. Only about 1,700 women (less than 1 percent) were native American scientists and engineers (the remainder were in other racial groups or did not report their racial status). Minorities are more highly represented among women scientists and engineers than among men. In 1982, 92 percent of the male scientists and engineers were white, 2 percent were black, about 4 percent were Asian, and less than 1 percent (12,000) were native American.

Over the 1972-82 decade, employment of minority women in science and engineering has increased more rapidly than employment of white women. While employment of white female S/E's increased by more than 200 percent over the decade, employment of both black and Asian women grew at roughly twice the rate for white women, albeit from relatively small bases.

Table 1-1 presents another way of viewing the status of minority women scientists and engineers. For some groups, the proportion of minority women was higher than the proportion of minority men. Black women represent a larger share of all female S/E's than do black men of all male S/E's. Women represent about 13 percent of total S/E employment across all racial groups, but black women represent over one-third (34 percent) of all employed black S/E's.

Table 1-1. Employed scientists and engineers by race and sex: 1982

(Percent)

Race	Total	Men	Women
Total	100	87	13
White	100	88	12
Black	100	66	34
Asian	100	83	17
Native American	100	87	13
Total[1]	——	100	100
White	——	92	85
Black	——	2	7
Asian	——	4	6
Native American	——	0.4	0.4

[1] Does not add to 100 because other and no report are not included.

SOURCES: Based on Appendix tables 2 and 3.

Among women scientists and engineers; only Asians are more highly represented in the S/E work force than in the general work force. Of all female S/E's in 1982, 6 percent were Asian, while only about 1.8 percent of all women in the U.S. labor force were Asian.[9] It may be of interest to note that in 1982 about 72 percent of the female Asian S/E's were U.S. citizens. Among white women, about 96 percent were U.S. citizens. In contrast, black women represented about 7 percent of all women scientists and engineers, but 11 percent of all employed women in the U.S.[10]

Relatively few employed female S/E's with doctorates were members of racial minority groups. In 1981, only about 2.5 percent (1,000) of all doctoral women were black, 7 percent (2,800) were Asian, and less than 1 percent (300) were native American. Among doctoral males, 1 percent were black, 8 percent were Asian, and less than 1 percent were native American. Thus, black females constitute a larger share of all black doctoral S/E's than do other minority women of their respective racial groups.

Field—The field distribution for women scientists and engineers varies considerably by race. However, regardless of race, women are more likely than men to be scientists rather than engineers. In 1982, about 13 percent of the white women were engineers, as were between 20 percent and 25 percent of the Asian and black women. Among scientists, the greatest number of white and Asian women were computer specialists. Among black women, the greatest number were social scientists (appendix table 3).

Years of Experience—Among all employed female scientists and engineers, whites reported fewer years of professional experience than did blacks. In 1982, over 60 percent of the white and Asian women reported fewer than ten years of professional experience. The comparable figure for blacks was about 55 percent.

At the doctoral level, black women have fewer years of professional experience than other women.[11] In 1981, 66 percent of the black women reported fewer than ten years of professional experience, with 40 percent reporting less than five years of such experience. About 60 percent of white and Asian women had less than ten years of experience. Among white and Asian women, roughly 30 percent had less than five years of experience.

Career Patterns—Black women are more likely than white or Asian women to report management or administration as their primary work activity. In 1982, 18 percent of the black women were in management, compared with 15 percent and 11 percent for white and Asian women, respectively.

Tenure status and academic rank can also be used as surrogate measures of career development. Among doctoral women in educational institutions, blacks are in tenure-track positions more often than whites and Asians. In 1981, over 69 percent of the black doctoral women were in tenure-track positions, compared to approximately 60 percent of the white women and only 45 percent of the Asian women. Although black women were more often in tenure-track positions, about the same proportion of black and white women reported holding tenure (slightly less than two-fifths). Among doctoral women, variations in the proportion holding professorial rank range from 88 percent (Asian women) to 95 percent (black women).

Asian women scientists and engineers in 1982 reported an average salary of $28,500 per year, slightly higher than that reported for either black ($27,500) or white ($27,000) women (appendix tables 50 and 51). Female doctoral scientists' and engineers' salaries also vary by race. In 1981, black women reported salaries (about $29,000) above those for white women (about $27,000). Black women reported higher salaries than white women across most major fields of science.

RACIAL MINORITIES IN SCIENCE AND ENGINEERING

Employment Levels and Trends

Blacks, Asians, native Americans, and other minorities differ in representation among scientists and engineers, in representation in the general population, and in employment characteristics. Thus, any discussion of minorities in science or engineering should distinguish among various racial or ethnic groups.

Blacks are underrepresented in science and engineering, whereas Asians are not underrepresented. The representation of native Americans among scientists and engineers is roughly equal to their representation in the total U.S. labor force. While blacks represented 2.6 percent (86,000) of all employed scientists and engineers in 1982, they accounted for over 9 percent of total U.S. employment and over 6 percent of all employed professional and related workers.[12] Native Americans represented about 0.4 percent (13,500) of all scientists and engineers and about 0.5 percent of the total U.S. labor force[13] (data for native Americans should be viewed with caution, since the estimates both for scientists and engineers and for the overall U.S. labor force are based on an individual's own classification with respect to his or her native American heritage; such perceptions may change over time). Asians, on the other hand, represented 1.6 percent of the U.S. labor force but 4.5 percent of employed scientists and engineers. It should be noted that only about 68 percent (67 percent of the men and 72 percent of the women) of the Asian scientists and engineers in 1982 were U.S. citizens. Among whites, about 94 percent were U.S. citizens.

Over the 1972-82 decade, employment of both blacks and Asians increased more rapidly than employment of whites, and the minority fraction of the S/E work force increased, albeit from a small base. Employment of both blacks and Asians almost tripled between 1972 and 1982, while employment of whites increased by about 40 percent.[14] As a result of these differential growth rates, the share of total S/E employment held by whites declined from 96 percent to 91 percent, while the black share rose from roughly 1 percent to 2.5 percent, and the Asian share grew from less than 2.5 percent to 4.5 percent.[15]

At the doctoral level, employment of blacks, Asians, and native Americans has also been increasing more rapidly than employment of whites. Between 1973 and 1981, employment of blacks more than doubled (2,100 to 4,300), employment of native Americans increased fivefold (to over 2,000), and employment of Asians almost tripled (to about 27,000). Among whites, employment increased by about 50 percent (from 200,900 to 304,400). More recently (1979-81), employment of both blacks and Asians increased over 25 percent, while employment of whites and native Americans was up about 10 percent.

Despite rapid growth in employment, blacks in 1981 represented only about 1.3 percent of all employed doctoral scientists and engineers, up slightly since 1973 (0.9 percent). The almost 27,000 employed Asians in 1981 represented almost 8 percent of the total, up significantly from 4 percent in 1973. Native Americans represented less than 1 percent of the total in 1981.[16]

Field

Field distributions vary among racial groups between engineers and scientists and among fields of science. Across all races, over half of all employed scientists and engineers in 1982 were engineers, ranging from almost two-thirds of the Asians to almost one-half of the blacks (figure 1-7). The relatively high proportion of women among black scientists and engineers (roughly one-third in 1982) affects the field distribution of blacks. For example, about three-fifths of black men were engineers rather than scientists.

There are wide field variations across racial groups in the sciences (figure 1-7). Blacks are more likely than whites or Asians to be social scientists. About one-fifth of the black scientists were computer specialists in 1982, as were roughly 25 percent of both whites and Asians. It is interesting to note that over half of the black computer specialists in 1982 were women. In contrast, among white computer specialists, roughly one-quarter were women.

The index of dissimilarity can be used to summarize general field differences among racial groups.[17] The index between whites and blacks in 1982 was 15; that is, about 15 percent of the blacks would have to change fields or occupations to have a distribution identical to that of whites. The index of dissimilarity between whites and Asians was 14.

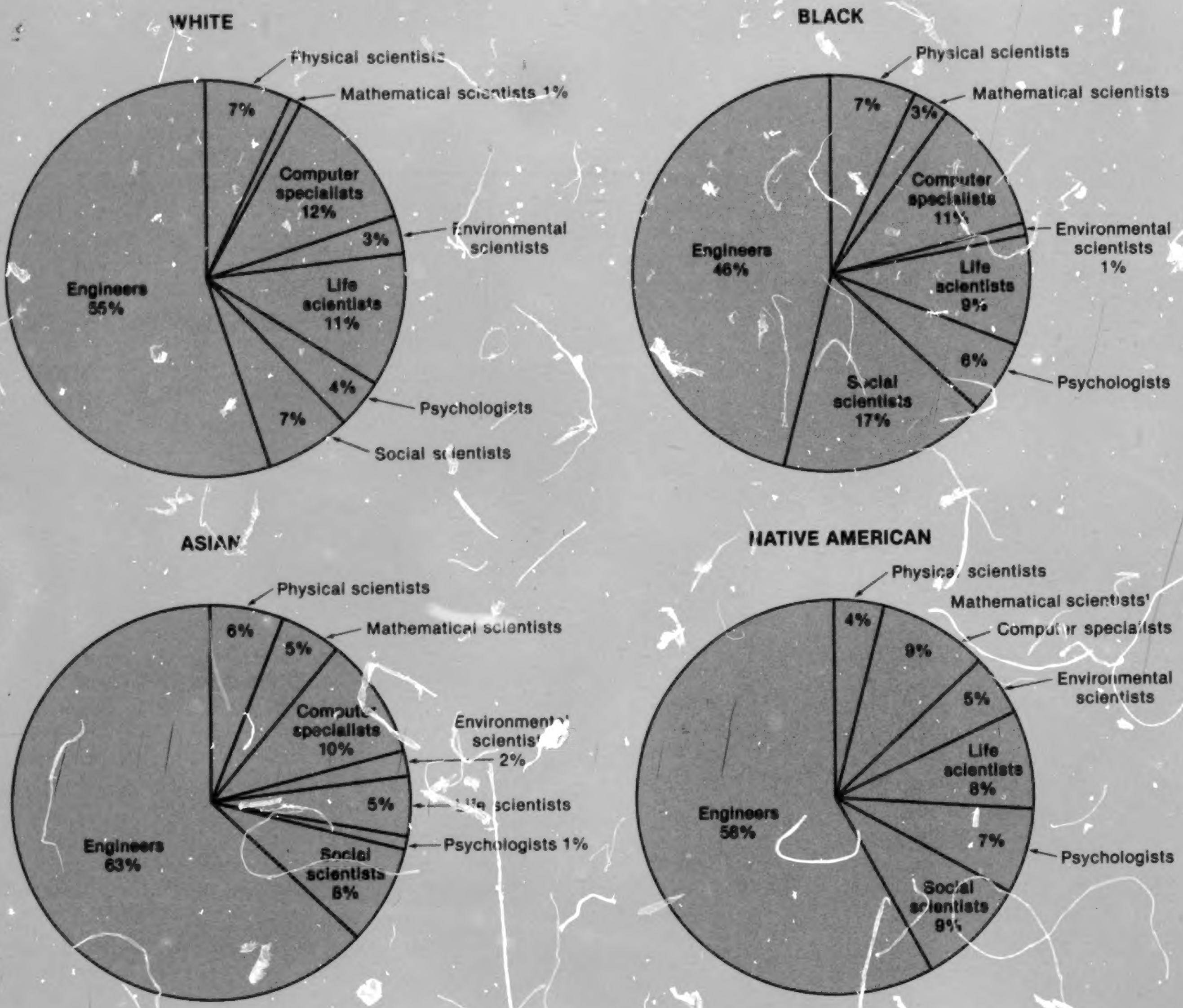
The differences in field distributions across groups affect minority representation in various fields (appendix table 2). For example, while only 2.6 percent of all scientists and engineers were black in 1982, about 6 percent of all social scientists were black. Asians, again by way of example, represented almost 5 percent of all scientists and engineers, but only about 1 percent of all psychologists.

Among doctoral S/E's, the various racial groups are also distributed differently between engineers and scientists and across fields of science. A larger proportion of blacks than of whites and Asians were social scientists and psychologists in 1981, while a large share of Asians were engineers and physical scientists. The index of dissimilarity between black and white doctoral S/E's in 1981 was 21; between Asian and white doctoral S/E's, it was 22.

The relatively high proportion of women among black doctoral scientists and engineers (24 percent in 1981) does not appear to affect the field distribution of blacks. Although black men are more likely than black women to be engineers, or physical and mathematical scientists, slightly over two-thirds of the black male doctoral S/E's were in the life and social sciences and psychology. About one-half of the white S/E men were in these fields.

Field distributions at the doctoral level have changed over time with some variation by race. The proportion of whites in the social sciences and psychology increased between 1973 and 1981 from 24 percent to 29 percent. Over

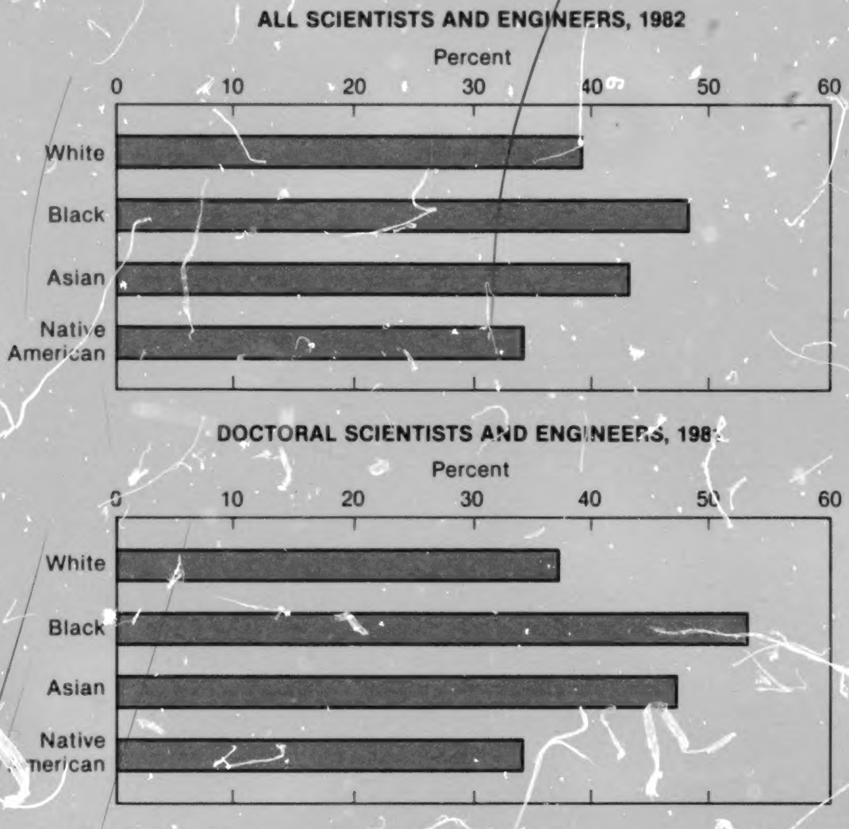
Figure 1-7. Field distribution of employed scientists and engineers by race: 1982



[1] Less than 0.5 percent

SOURCE: Based on Appendix table 2.

Figure 1-8. Proportion of S/E's with less than ten years of professional experience by race



SOURCES: Based on Appendix tables 33 and 37.

the same period, the proportion of blacks increased from 30 percent to 48 percent. Among Asians, the field distributions showed relatively little change between 1973 and 1981.

Years of Experience

In view of their more rapid employment increases, which in part reflect affirmative action programs, minorities generally have fewer years of professional experience than whites. Less experience generally means lower salaries and a lower propensity to be in management or other senior positions. In 1982, about two-fifths of the white and Asian scientists and engineers at all degree levels reported fewer than ten years of professional experience, compared with about one-half of the blacks and one-third of the native Americans (figure 1-8).

At the doctoral level, blacks and Asians also have less professional experience than whites (figure 1-8).[13] Over one-half (53 percent) of the black doctoral scientists and engineers and almost half (47 percent) of the Asians in 1981 reported fewer than ten years of professional experience. Among whites, 37 percent reported fewer than ten years of professional experience. About one-third of the native Americans were in this category.

Career Patterns

The proportions of minorities working in management and administration compared with the majority can be a rough proxy for one type of "promotional opportunity." Within educational institutions, tenure status and academic rank can be used to gauge career progression. Differences in salaries between minorities and the majority can also be used to help measure differences in career patterns and progression.

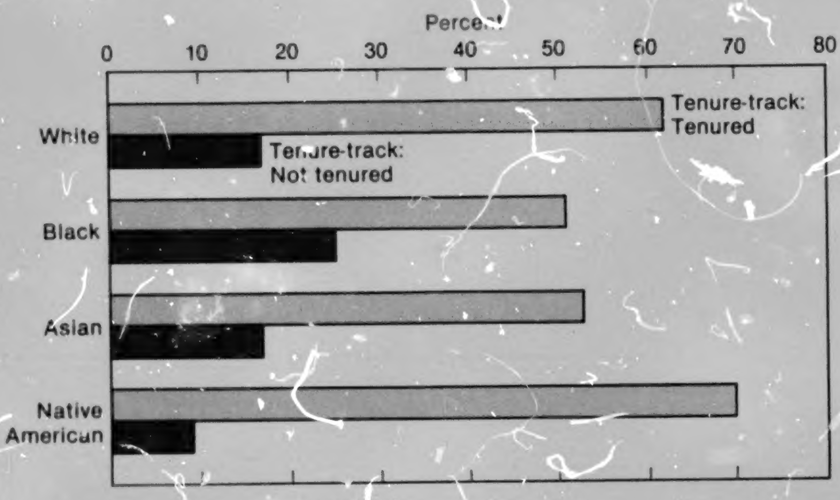
Given the finding that minorities generally have fewer years of professional experience than whites, it is not surprising that minorities are less likely than whites to report management or administration as their primary work activity. About 25 percent of the white scientists and engineers reported management or administration as their primary work activity in 1982. Among minorities, blacks (23 percent) were almost as likely as whites and more likely than Asians (18 percent) to do so. Native Americans are an exception: in 1982, 31 percent of the native Americans were in management.

Within educational institutions, blacks are less likely than whites to hold tenure (figure 1-9). In 1981, 62 percent of the white doctoral scientists and engineers in colleges and universities held tenure; among blacks, 51 percent were tenured. Of those not holding tenure, a larger proportion of blacks than whites were in tenure-track positions (25 percent vs. 17 percent). Among Asians, 53 percent held tenure and an additional 17 percent were in tenure-track positions. To some extent, the lower tenure rate for blacks reflects the fact that black doctorate holders have fewer years of professional experience since completing the doctorate than do whites.

For those with doctorates who are four-year college or university teachers, the propensity to hold professorial rank is fairly uniform for all races. In 1981, about 95 percent of the whites, blacks, and Asians held professorial rank. Blacks, however, were less likely than members of other races to hold full professorships. In 1981, 44 percent of the white teachers in colleges and universities were full professors; among blacks, the proportion was 32 percent. The comparable proportion for Asians was 42 percent.

Salaries—Black scientists and engineers earn, on average, lower salaries than white, Asian, and native American S/E's

Figure 1-9. Doctoral scientists and engineers in educational institutions by tenure status and race: 1981



SOURCE: National Science Foundation, unpublished data.

(table 1-2). In 1982, blacks reported average annual salaries of approximately $30,000, while the figure for all other races was about $34,000. Over the 1972-82 decade, the gap in salaries between black and white scientists and engineers has remained relatively constant, with salaries for blacks averaging roughly 90 percent of those for whites in 1972 and 1982. Controlling for field has no significant impact on the black/white salary differential.

In the sciences, salaries for blacks average about 90 percent of those for whites. In addition, although black engineers earn more than black scientists, salaries for black engineers also averaged about 90 percent of those for whites in 1982. Salaries for blacks are lower than those for whites across all age groups and across all major fields of science. In some fields, however, the difference is narrower than at the overall level. For example, black computer specialists earned about 95 percent as much as white computer specialists.

Salaries among doctoral scientists and engineers also vary by race. For all fields combined, average salaries in 1981 were $34,700 for whites, $33,700 for Asians, and $32,600 for blacks. With some exceptions, this same general pattern was evident across all S/E fields. Black mathematical scientists, however, reported higher salaries ($33,400) than did other races. Among black doctoral scientists and engineers in 1981, annual salaries were $33,800 for men and $28,800 for women. Regardless of race, salaries for women were lower than for men at the doctoral level.

The racial salary patterns outlined above are also evident among recent S/E bachelor's degree recipients. In 1982, whites and Asians reported similar salaries (about $21,000), and blacks reported average salaries ($17,300) about 17 percent below those reported by whites. At the master's level, salaries for Asians ($29,700 per year) were higher than those reported by both whites ($27,300) and blacks ($24,600).

Table 1-2. Annual salaries by race: 1982

Race	All S/E's	Scientists	Engineers
Total	$34,100	$32,000	$35,700
White	34,200	32,100	35,900
Black	30,100	28,800	31,600
Asian	34,300	32,500	35,200
Native American	34,200	32,500	35,400

SOURCE: Appendix table 49.

HISPANICS IN SCIENCE AND ENGINEERING

Hispanics are a diverse ethnic group, and it is desirable to distinguish among Mexican Americans, Puerto Ricans, and other Hispanics, since socioeconomic backgrounds and reasons for underrepresentation may differ among these groups. However, because of data limitations, most of the discussion on Hispanics in this report treats them as an aggregate.

In 1982, over 25 percent of the Hispanic scientists and engineers were Mexican Americans and about 19 percent were Puerto Rican. Over half (53 percent) were "other Hispanics," a category that includes individuals whose origins are in Spain or the Spanish-speaking countries of Central and South America. Also included in this category are those who identified themselves as Spanish, Spanish-American, Hispanic, Latino, etc. The remainder did not report the origin of their Hispanic heritage. It should be noted that roughly 15 percent of the Hispanic S/E's in 1982 were not U.S. citizens. Among all scientists and engineers, about 7 percent were non-U.S. citizens.

Employment Levels

Hispanics are underrepresented among scientists and engineers. In 1982, the approximately 74,000 Hispanic scientists and engineers represented about 2.2 percent of all employed scientists and engineers. Almost 5 percent of all employed persons 25 years of age or older were Hispanic, as were 2.6 percent of all professional and related workers.[19]

Hispanics are also underrepresented

among doctoral scientists and engineers. The 4,800 Hispanics Ph.D.'s in 1981 represented about 1.5 percent of all employed doctoral S/E's, up from 1,200, or 0.6 percent, in 1973. Among Hispanic doctoral scientists and engineers, almost 20 percent were not U.S. citizens in 1981, and an additional 20 percent were foreign born but held U.S. citizenship.

Women are more highly represented among Hispanic scientists and engineers than are all women among all scientists and engineers. In 1982, about 16 percent of the Hispanic S/E's were female, compared with 13 percent among all scientists and engineers. Almost 12 percent of the Hispanic doctoral S/E's were female in 1981, about the same percentage as among all doctoral S/E's. As with all women doctorates, Hispanic women were more likely than Hispanic men to be psychologists or social scientists.

Field

Figure 1-10 shows the field distribution of Hispanic and all scientists and engineers. Almost three-fifths of the Hispanics in 1982 were engineers rather than scientists, roughly similar to the overall engineering-science split. Hispanic scientists are somewhat more likely to be social scientists and less likely to be computer specialists.

At the doctoral level, the field distribution of Hispanics is similar to that for all doctoral scientists and engineers. Hispanics, however, are somewhat less likely than non-Hispanics to be engineers and somewhat more likely to be psychologists or social scientists.

Years of Experience

As with other minorities, Hispanics, on average, have fewer years of professional experience than all scientists and engineers. In 1982, almost one-half of the Hispanic scientists and engineers had fewer than ten years of professional experience; among all S/E's, the comparable figure was about two-fifths. The relatively high proportion of Hispanic scientists and engineers with fewer than ten years of professional experience results in part from the large proportion (almost 70 percent of Hispanic women with less than ten years of experience. Among Hispanic men, the comparable figure was about 45 percent.

At the doctoral level, a higher proportion of Hispanic S/E's have fewer than ten years of professional experience than all doctoral S/E's: fully one-half vs. about two-fifths. Hispanic women (two-thirds) were more likely than men (almost one-half) to report fewer than ten years of experience.

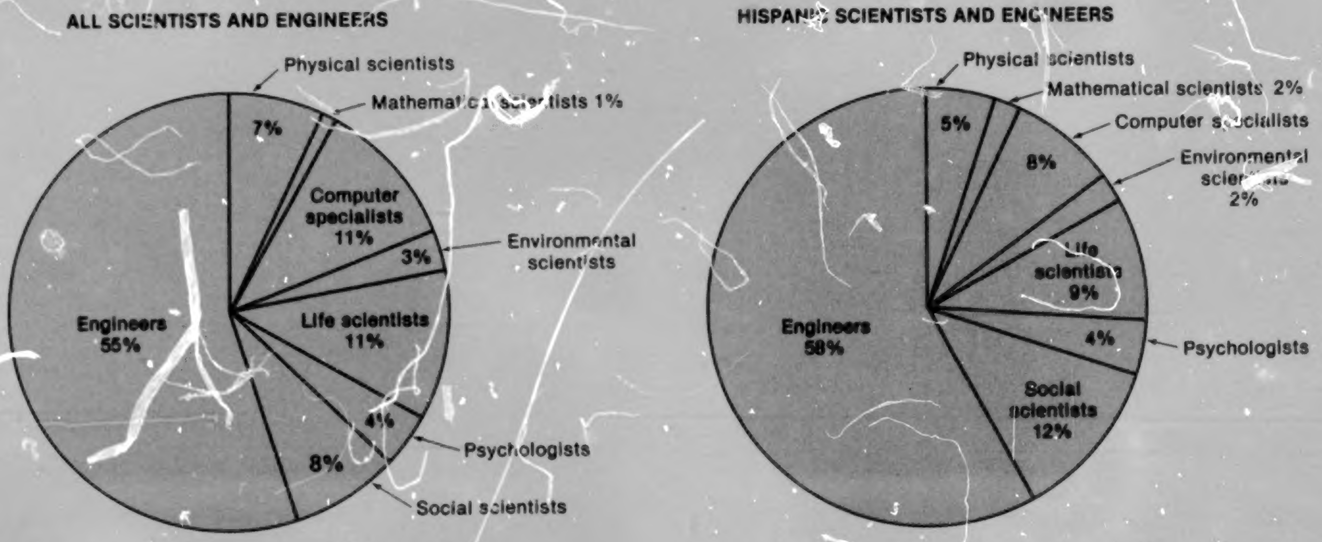
Career Patterns

Hispanic scientists and engineers are about as likely as all scientists and engineers to cite management or administration as their primary work activity (22 percent vs. 25 percent).

Within educational institutions, there are few differences between Hispanic and non-Hispanic doctoral S/E's with respect to tenure status and professorial rank. In 1981, approximately the same proportions (about three-quarters) of Hispanics and all S/E's held tenure or were in tenure-track positions. Over 90 percent of both Hispanic and all doctoral scientists and engineers in educational institutions held professorial rank in 1981. Hispanics, however, are less likely to hold full professorships than non-Hispanics (30 percent vs. 44 percent).

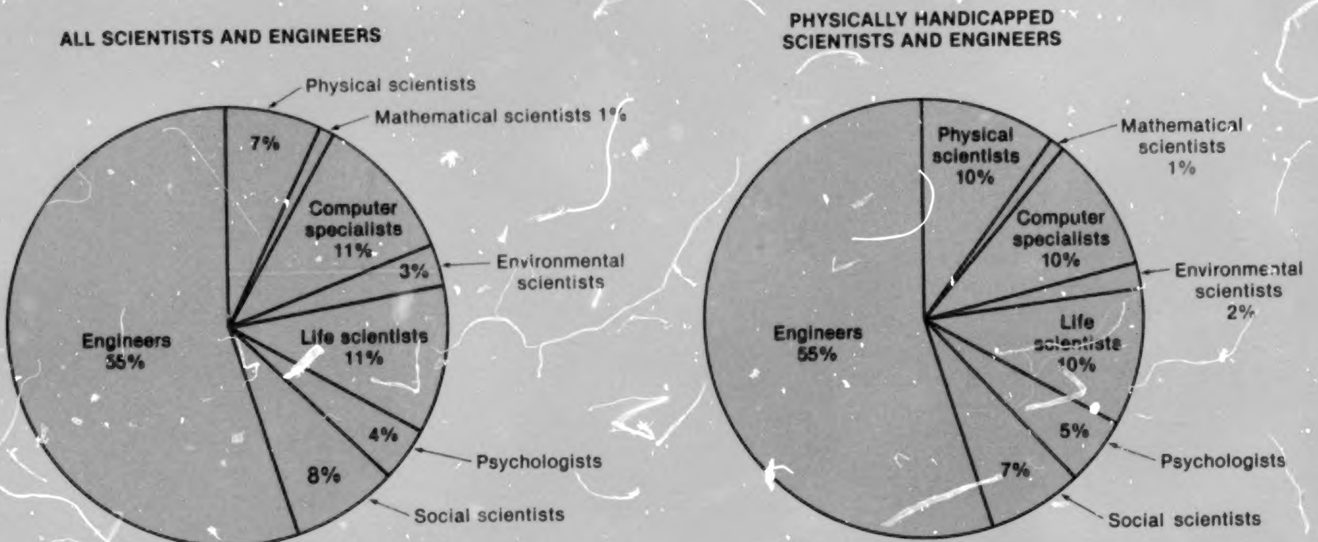
Salaries—On average, Hispanic scientists and engineers earn less than other scientists and engineers. The average

Figure 1-10. Field distribution of employed scientists and engineers by Hispanic status: 1982



SOURCES: Based on Appendix tables 1 and 4.

Figure 1-11. Field distribution of all employed scientists and engineers and physically handicapped scientists and engineers: 1982



SOURCES: Based on Appendix tables 1 and 12.

salary for Hispanic S/E's in 1982 was $31,500, lower than the $34,100 reported by all scientists and engineers. Hispanic men have higher salaries than Hispanic women ($32,900 vs. $23,100), but both Hispanic men and women reported lower salaries than all male ($35,100) and all female ($27,100) scientists and engineers.

Among doctoral scientists and engineers, Hispanics earned approximately 97 percent as much as all scientists and engineers ($33,600 vs. $34,600) in 1981. By field, Hispanic salaries ranged from general parity to 93 percent among computer specialists and engineers.

Lower average salaries for Hispanics are also evident among recent S/E graduates. At the bachelor's level, Hispanics reported average salaries of $17,000; all recent S/E graduates had salaries of $20,700. At the master's level, this pattern is reversed. Hispanics reported average salaries above those for all recent S/E graduates ($28,700 vs. $27,400).

PHYSICALLY HANDICAPPED IN SCIENCE AND ENGINEERING

As part of the surveys underlying the employment and related data in this report, respondents were asked if they were physically handicapped and, if so, to specify the nature of the handicap (visual, auditory, ambulatory, or other). There were fairly high nonresponse rates to questions relating to handicap status; in the largest survey,[20] for example, about one-half of the respondents did not answer questions relating to handicap status. Consequently, data pertaining to handicap status must be viewed with caution.

Among those reporting physical handicaps, 28 percent reported an ambulatory handicap, 23 percent had a visual handicap, and 18 percent reported an auditory handicap. The remainder (about 30 percent) did not specify the nature of their handicap.

In 1982, about 85,000 S/E's (about 2.4 percent) reported a physical handicap. The field distribution of handicapped scientists and engineers is similar to that for all scientists and engineers (figure 1-11). Those reporting a handicap were as likely as all scientists and engineers to be engineers rather than scientists. Among scientists, those reporting a handicap are more likely to be physical scientists.

Scientists and engineers reporting handicaps are much more likely than all scientists and engineers to be out of the labor force. Almost 20 percent of the physically handicapped S/E's, but only 5 percent of all scientists and engineers, were not in the labor force (that is, either not working or not looking for jobs) in 1982.

ENDNOTES

1. U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings*, Vol. 30, No. 1, January 1983, p. 157.

2. See Technical Notes contained in the appendices for NSF's definition of fields, etc.

3. U.S. Commission on Civil Rights, *Social Indicators of Equality for Minorities and Women*, (Washington, D.C., August 1978), p. 39. "The index...represents the percentage of a group who would have to change occupations in order for the group to have identical occupational distributions of a comparison group. If two groups had the same distributions of occupations, the index of dissimilarity would be 0.0...." p. 44.

4. Years of professional experience since the doctorate. As would be expected, female doctorates are, on average, younger than their male colleagues.

5. Committee on the Education and Employment of Women in Science and Engineering, National Research Council, *Climbing the Ladder, An Update on the Status of Doctoral Women Scientists and Engineers*, (Washington, D.C.: National Academy Press, 1983), chapter 4.

6. There is a large amount of literature on salary differences between women and men. See, for example, Nancy C. Ahern, *Career Outcomes in a Matched Sample of Men and Women Ph.D.'s: An Analytical Report*, (Washington, D.C.: National Academy Press, 1981); Jonathan R. Cole, *Fair Science: Women in the Scientific Community*, (New York: The Free Press, 1979); Michael G. Finn, *Training, Work Experience, and the Earnings of Men and Women Scientists and Engineers*, (Oak Ridge, Tenn.: Oak Ridge Associated Universities, December 1981); and Robert H. Frank, "Why Women Earn Less: The Theory and Estimation of Differential Overqualification," *American Economic Review*, Vol. 68, No. 3, June 1978, pp. 360-373.

7. U.S. Department of Labor, Bureau of Labor Statistics, unpublished data.

8. National Science Foundation, unpublished analysis.

9. Department of Commerce, Bureau of the Census, *Detailed Occupation and Years of School Completed by Age for the Civilian Labor Force by Sex, Race, and Spanish Origin: 1980*, Supplementary Report #PC 80-SI-8, 1980 Census of the Population, (Washington, D.C., 1983), p. 7.

10. *Employment and Earnings*, January 1983, p. 180.

11. Years of professional experience since the doctorate.

12. *Employment and Earnings*, January 1983, p. 179.

13. Data for native Americans and Asians are from *Detailed Occupation and Years of School Completed*, Report #PC 80-SI-8.

14. Comparable growth rates for native Americans are not available.

15. National Science Foundation, unpublished data.

16. The data for native Americans shown in this report differ from earlier published data. Historical data for native Americans have been revised to reflect changes in individuals' perceptions of their race and to correct for those not reporting race. It is interesting to note that of those who reported they were native American in 1981 and responded to the 1979 survey, almost half reported a race other than native American in 1979, and about 15 percent did not report race. These revisions based on an individual's perception of his/her native American heritage suggest that data for native Americans be viewed with caution.

17. *Social Indicators of Equality*, p. 39.

18. Years of experience since the doctorate.

19. *Employment and Earnings*, January 1983, pp. 179-180.

20. The 1982 Postcensal Survey. See Technical Notes.

CHAPTER 2

Labor Market Indicators

Standard labor market indicators, such as labor force participation and unemployment rates, are useful in assessing relative labor market conditions (i.e., employment relative to available supply) for scientists and engineers. In addition, the National Science Foundation has developed three measures unique to scientists and engineers: the S/E employment rate, the S/E underemployment rate, and the S/E underutilization rate.[1]

Labor force participation rates measure the fraction of the S/E population in the labor force—that is, working or seeking employment. Low rates suggest that a significant fraction of those with S/E training and skills are not using their skills in S/E jobs or in any other jobs.

Unemployment rates measure the proportion of those in the labor force who are not employed but seeking employment. Higher rates for women and minorities may signify that these groups face labor market problems different from those of men and the majority in the scientific and engineering work force. Unemployment rates, however, are incomplete indicators of market conditions for scientists and engineers. They do not indicate the degree to which those with education and training in science and engineering are successful in finding jobs in science and engineering.

To better assess the market conditions for scientists and engineers performing S/E work, the S/E employment rate has been developed. This rate measures the degree to which employed scientists and engineers have jobs in science and engineering fields.

The degree of S/E underemployment is another useful indicator of the extent to which scientists and engineers utilize their training and skills. When full-time jobs are not available, individuals may accept part-time jobs. When jobs in science and engineering are not available, some S/E's accept jobs in other areas. Thus, some part-time employment (e.g., working part-time but seeking full-time employment) is an indicator of underemployment, as is working in a non-S/E job when S/E work would be preferred. The S/E underemployment rate has been developed to provide an overall statistical measure of both involuntary part-time and involuntary non-S/E employment.

To derive a more complete estimate of overall S/E underutilization, numbers for both the unemployed and the underemployed can be combined and presented as a percent of the labor force (the S/E underutilization rate). This rate is only a partial measure of potential underutilization since it does not account for those who may have greater S/E skills than jobs require.

Disparities in these labor market variables across groups can reflect differences in labor market behavior, in demographic characteristics among the groups, in behavior of employers, or some combination of these factors.

One question concerning racial minorities is the degree to which labor market indicators are influenced by the relatively large proportion of minorities in the labor force who are females. In 1981, for example, 24 percent of the black doctoral scientists and engineers were female. Where data are available and where there are differences by sex within the racial or ethnic groups, indicators are presented for both men and women.

WOMEN SCIENTISTS AND ENGINEERS

Labor Force Participation Rates

Women scientists and engineers are more likely than all women or all women college graduates to be in the labor force—that is, working or seeking employment. In 1982, about 93 percent of the women scientists and engineers were in the labor force, compared with about 53 percent of all women and 76 percent of all college-educated women in the United States.[2] The rate for male scientists and engineers was about 95 percent, above the 77 percent rate for all men in the United States and equal to that for all college-educated men.[3] Over the 1972-82 decade, the gap in labor force participation rates between female and male scientists and engineers narrowed. Rates for women increased by about 7 percentage points, while the rates for men declined slightly. Labor force participation rates for both women and men vary in a fairly narrow range by field, with the rates for women generally below those for men across all major fields (appendix table 45).

Among doctoral scientists and engineers, women are also less likely than men to be employed or seeking employment. In 1981, the labor force participation rate for doctoral women was 92 percent, above the 90 percent rate recorded in 1979 but below the 96 percent rate for men (appendix table 46). Although there is variation by field, the rates for women in all science fields were lower than for men; in engineering, the rates were essentially the same.

Labor force participation rates for recent female S/E graduates (excluding full-time graduate students) are generally lower than the rates for recent male graduates. Among recent graduates (1980 and 1981) at the bachelor's level, the labor force participation rate for women (92 percent) was below that for men (97 percent) when measured in 1982. At the master's level, the rate for women (95 percent) was also below that for men (98 percent), although the rates for females and males were essentially equal among mathematical science, life science, and psychology graduates.

Women and men scientists and engineers report different reasons for not being in the labor force. Men are much more likely than women to cite retirement (71 percent vs. 11 percent) as the reason for not working. Women, on the other hand, are much more likely to cite family responsibilities (36 percent vs. less than 1 percent). Among all women in the United States not in the labor force in 1982, about three-fourths reported family responsibilities as the reason for not seeking work.[4]

Compared with all scientists and engineers, doctoral S/E's cite different reasons for being out of the labor force. Regardless of sex, a larger fraction of doctoral S/E's who are out of the labor force are retired. Among doctoral women out of the labor force in 1981, 44 percent were retired; among men, 78 percent were retired.

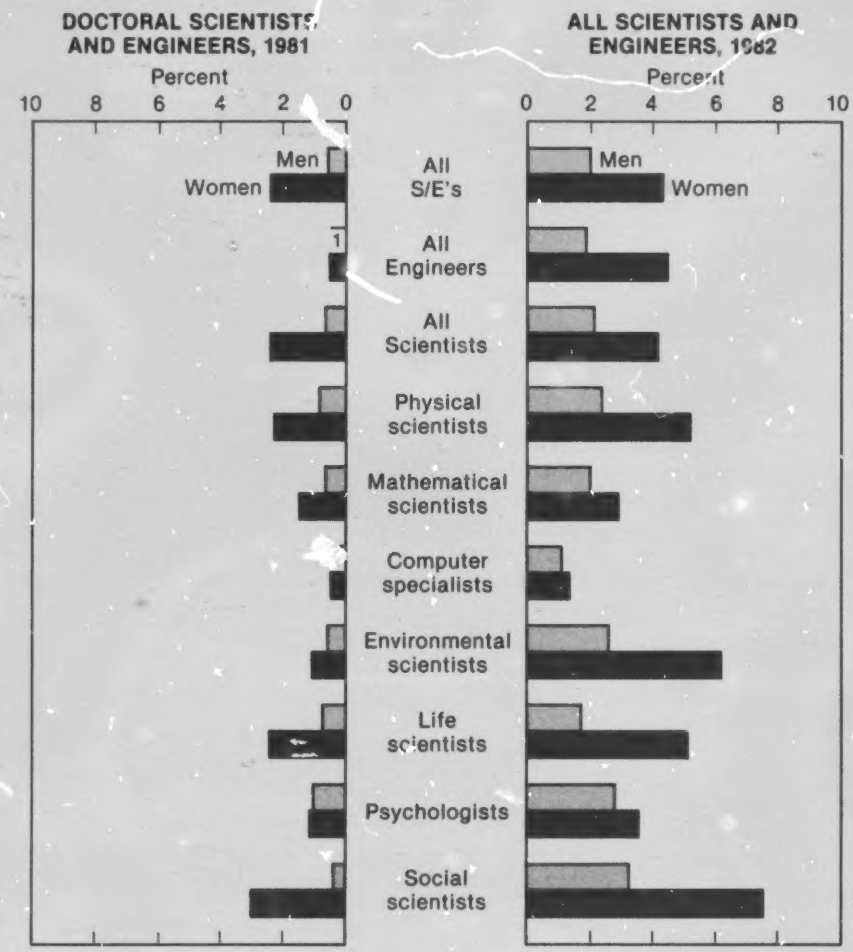
The presence of children strongly influences labor force participation of women in the U.S. labor force.[5] In 1981, for example, the labor force participation rate for married women with children 6 to 17 years of age was 63 percent. For those with children under 6 years of age, the rate was 48 percent.[6] The impact of children on the labor force participation rate of women scientists and engineers is much less than among all women in the United States. In 1982, female scientists and engineers with children aged 6 to 17 had a labor force participation rate of 82 percent, while the rate for those with children under 6 years of age was 94 percent, essentially equal to the rate for all female scientists and engineers. The presence of children age 6 and under appears to reduce the propensity of doctoral women to be in the labor force. Among those with young children in 1981, the labor force participation rate was 90 percent; for those with children 6 to 18 years of age, the rate was almost 95 percent.

Unemployment Rates

Once in the labor force, female scientists and engineers are more likely than their male colleagues to be unemployed. In 1982, the unemployment rate for women scientists and engineers was 4.3 percent, substantially above the 2.0 percent rate for men. The gap between female-male unemployment rates has persisted over the 1972-82 decade. For example, in 1972, the unemployment rate for women S/E's was roughly twice that for men. The unemployment rate for women S/E's in 1982 was below the rate recorded for all women in the United States (9.4 percent) but higher than that for women professional and technical workers (3.6 percent)[7] and for all women college graduates (3.2 percent).[8]

Unemployment rates for both female and male scientists and engineers vary considerably by field, with the rates for women above those for men across all fields (figure 2-1). Among scientists, about 4.2 percent of the women but only 2.1 percent of the men were unemployed in 1982. The smallest rate differential between women and men was found among computer specialists, while the greatest difference was noted among social scientists. The fact that women and men are concentrated in different fields of science and engineering has little influence on the unemployment rate for women. After controlling for field, the unemployment rate for women remains twice that for men. Limited research suggests that unemployment rates for female S/E's are higher than those for their male counterparts because women are more likely to restrict their job search because of geographic location, family responsibili-

Figure 2-1. Unemployment rates by field and sex



[1] Less than 0.1 percent.
SOURCES: Appendix tables 45 and 46.

ties, and desire for part-time employment. Evidence shows that if unemployed scientists and engineers of either sex who have job search restrictions are excluded from the computations of unemployment rates, the unemployment rate is virtually identical for male and female scientists and engineers.[9]

Unemployment rates for both female and male scientists and engineers with doctorates are well below the rates for those at all degree levels. However, in 1981, women doctorates reported an unemployment rate (2.3 percent) substantially above that for men (0.5 percent). Although these rates have declined since the early seventies, the unemployment rate differential between doctoral men and women persists. In 1973, the unemployment rate for men was 0.9 percent; for women, it was 3.8 percent. In 1981, unemployment rates for women were higher than for men within fields of science, although in engineering and computer specialties there was virtually no unemployment for both sexes (figure 2-1). Field, age, race, and family characteristics (i.e., marital status and presence of children) account for only a small proportion (10 percent) of the differences in unemployment rates. Even when these variables are standardized by means of multiple regression analysis, about 90 percent of the difference in unemployment rates between women and men remains unexplained.[10]

Women also experience more difficulty than men in finding jobs at the entry level. For recent (1980 and 1981) S/E graduates at the bachelor's level, 7.7 percent of the women and 5.1 percent of the men were unemployed, with the rates for women above those for men across most major fields of science. Among recent S/E master's degree graduates, rates for women were again higher than for men (7.3 percent vs. 2.3 percent), both in total and across most fields.

S/E Employment Rates

The S/E employment rate measures the extent to which employed scientists or engineers have a job in science or engineering. Depending on the specific reasons for non-S/E employment, a low S/E employment rate could be an indicator of underutilization. Factors relating to non-S/E employment include lack of available S/E jobs, higher pay for non-S/E employment, location, or preference for a job outside of science or engineering.

Once employed, female scientists and engineers are less likely than males to hold jobs in science or engineering. In 1982, the S/E employment rate for women was 80 percent; for men, it was 88 percent. S/E employment rates varied substantially by field, and much of the difference between women and men in this rate results from the fact that men are more likely than women to be engineers and that engineers are more likely than scientists to hold S/E jobs. Among engineers, the rates for women and men were essentially equal (93 percent). Among scientists, the rate for women was somewhat lower than the rate for men (78 percent vs. 81 percent). Female social scientists had an S/E employment rate higher than the rate for men. Among physical scientists, the rates were high for both sexes and about the same (almost 92 percent) (figure 2-2).

Women and men doctoral S/E's have substantially similar S/E employment rates. In 1981, the rate for both women and men was about 90 percent. On a

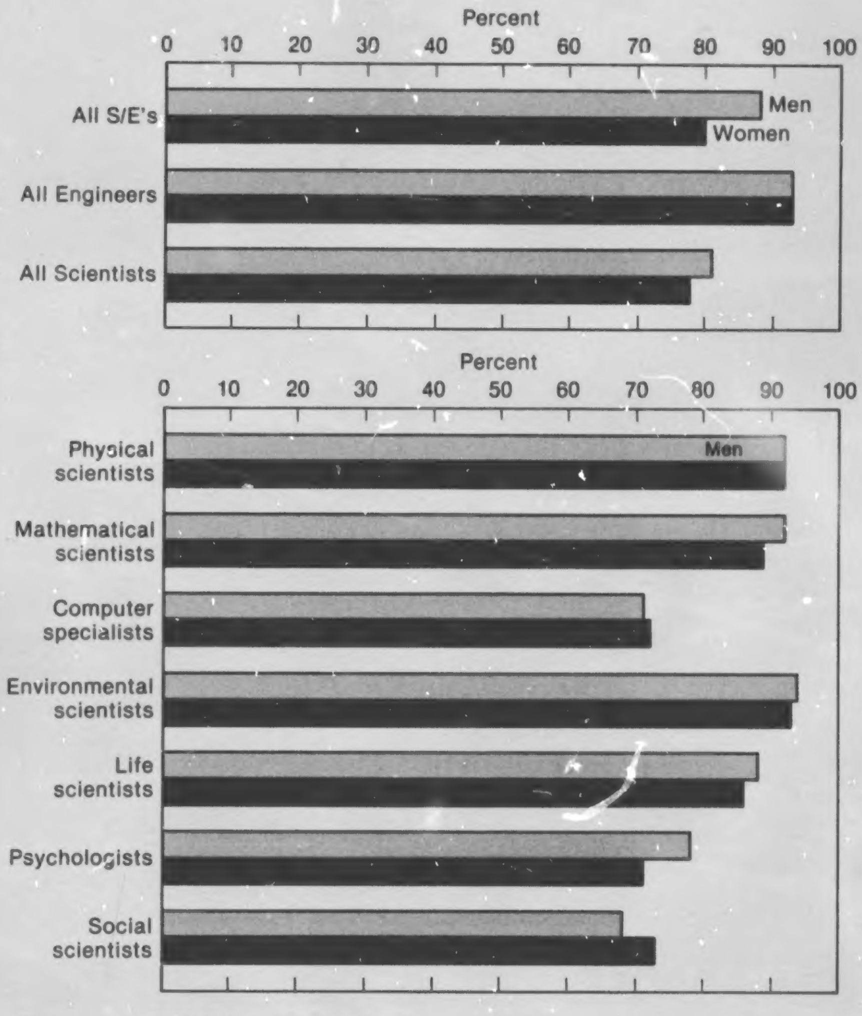


Figure 2-2. S/E employment rates by field and sex: 1982

SOURCE: Appendix table 45.

field-specific basis, there was also little significant variation between women and men.

The S/E employment rate for women who were recent S/E graduates was below that for men at both the bachelor's and master's levels. Among 1980 and 1981 bachelor's degree recipients, the S/E employment rate for women in 1982 was 46 percent; for men, it was 68 percent. On a field-specific basis, there was less variation in the rates between women and men (appendix table 47); generally, rates for women were lower than those for men, although in some instances they were higher. Among engineering graduates, the rate for women and men was 88 percent; for computer science graduates, rates were 96 percent for women and 89 percent for men. The difference in overall S/E employment rates between women and men reflects the fact that about 30 percent of the male graduates, but only 6 percent of the female graduates, were engineers.

S/E employment rates increase with additional years of education for both women and men, but the rate for women remains below that for men. The rates for recent male and female master's degree graduates were 77 percent and 64 percent, respectively.

S/E Underemployment Rates

Although unemployment rates of women scientists and engineers are relatively low compared with rates for women in the general population, those who are employed may be underemployed. Working in a non-S/E job or working part-time may indicate underemployment, depending on the reasons for such employment. To help measure the extent of potential underemployment, the S/E underemployment rate has been developed. This rate shows those who are involuntarily in non-S/E jobs or involuntarily working part-time as a percent of total employment.[11]

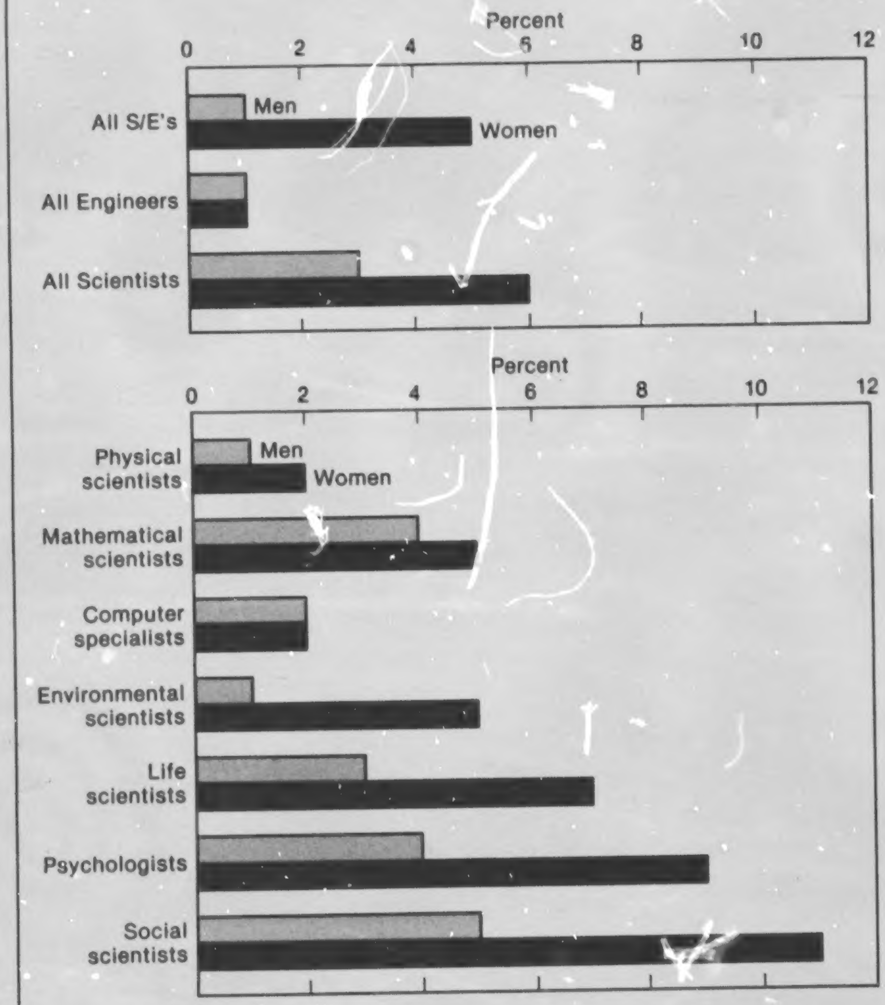
Not only are female scientists and engineers more likely than males to be unemployed, they are also more likely to be underemployed. The underemployment rate for women S/E's in 1982 was about 5 percent, compared with about 1 percent for men (figure 2-3). Part of this difference can be traced to the general concentration of women in science fields, where underemployment is greater than in engineering. Among engineers, underemployment for males and females was about 1 percent. Among scientists, women were more likely than men to be underemployed (6 percent vs. 3 percent). Underemployment rates for women were higher than those for men within all science fields with the exception of computer specialists, where the rates were essentially equal (about 2 percent).

Among doctoral scientists and engineers, women are more than twice as likely as men to be underemployed. In 1981, the underemployment rate for women was 3.0 percent; for men, it was 0.7 percent. Underemployment rates for women were above those for men among all major fields of science and engineering at the doctoral level (appendix table 46).

S/E Underutilization

To derive a more comprehensive indicator of potential underutilization, figures for those who are unemployed and those who are underemployed can be combined and expressed as a per-

Figure 2-3. S/E underemployment rates by field and sex: 1982



SOURCE: Appendix table 45.

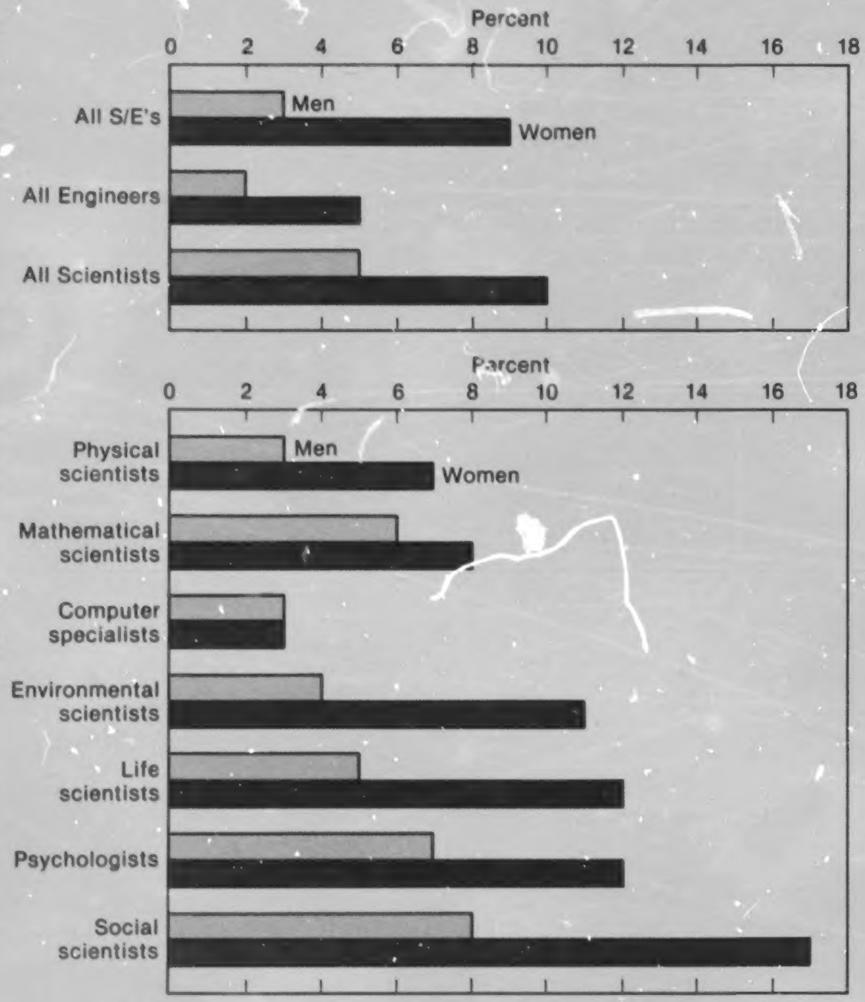
cent of the labor force. It is only a partial measure, however, since it does not take into account the number of scientists and engineers who may have jobs requiring skills below those that the job holders actually possess.

The underutilization rate for women scientists and engineers in 1982 was 9 percent; for men, it was 3 percent (figure 2-4). The rates for women were above those for men across all major fields with the exception of computer specialists, where they were about equal (3 percent). Female doctoral scientists and engineers are also more likely than men to report that they are underutilized. In 1981, the underutilization rate for doctoral women scientists and engineers was about 5 percent, almost five times the approximately 1 percent rate for men. Underutilization rates for women were above those for men within all major fields.

Minority Women By Race

An analysis was made of unemployment, underemployment, and underutilization data for women by race (see appendix tables). The rates varied in a fairly narrow range, but the observed differences were not statistically significant (at the 0.05 confidence level) and, therefore, these rates are not presented in this section.

Figure 2-4. S/E underutilization rates by field and sex: 1982



SOURCE: Appendix table 45.

Black women at all degree levels reported a labor force participation rate of about 97 percent, while the rates for white and Asian women were 93 percent and 94 percent, respectively, in 1982. Among women doctoral scientists and engineers, both blacks and Asians had higher labor force participation rates (about 95 percent) than white women (91 percent) in 1981.

Asian women registered a higher S/E employment rate (87 percent) than did white and black women (about 80 percent) in 1982. This same general pattern is also evident in all major scientific and engineering fields (appendix table 45). At the doctoral level, black women reported an S/E employment rate of 85 percent, compared with roughly 90 percent for white and Asian women.

RACIAL MINORITY SCIENTISTS AND ENGINEERS

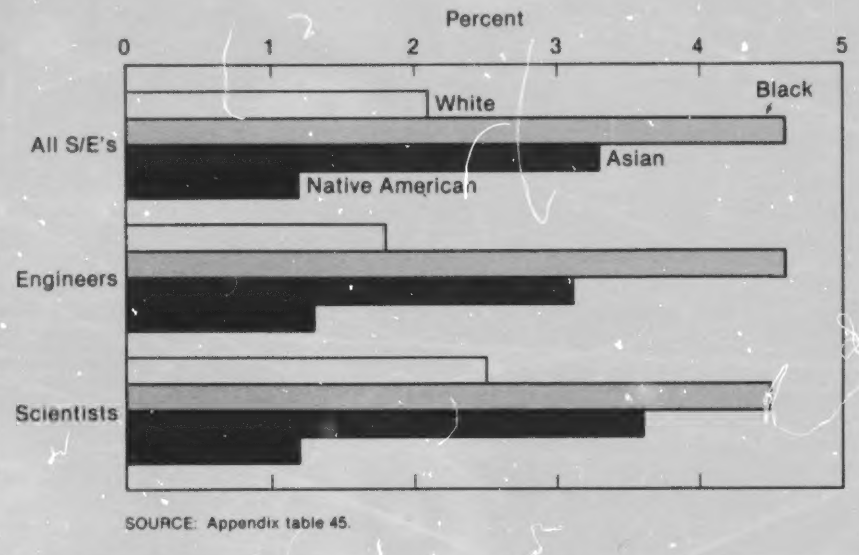
Labor Force Participation Rates

Minority scientists and engineers have labor force participation rates that are equal to or higher than those for comparable whites. The 1982 labor force participation rate for white scientists and engineers at all levels was 95 percent, similar to the rates for Asians and native Americans (96 percent) but below the 98 percent rate for blacks. Labor force participation rates for doctoral scientists and engineers in 1981 also fell within a fairly narrow range (95 percent to 97 percent), with little variation by field. Similarly, among recent S/E graduates, labor force participation rates were in the mid-to-high nineties for all races.

Unemployment Rates

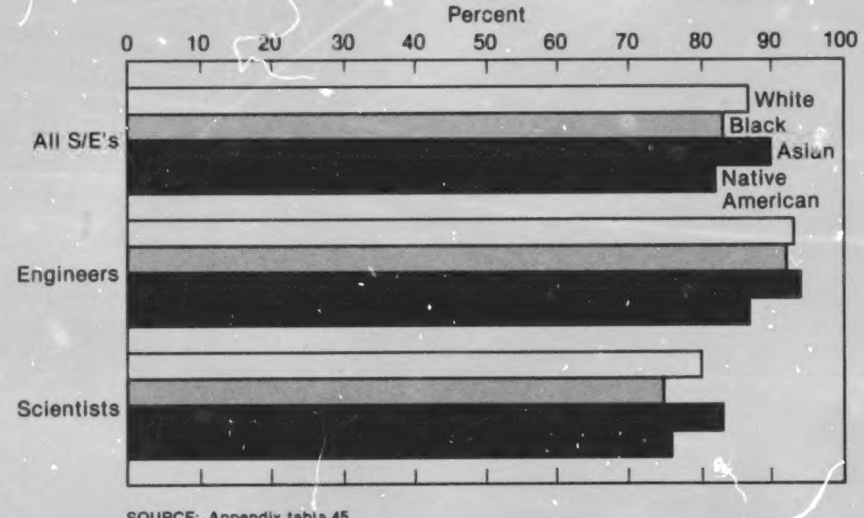
Unemployment rates for scientists and engineers vary by race, with the rates for minorities generally above those for whites (figure 2-5). In 1982, the unemployment rate for black S/E's (4.6 percent) was substantially greater than the rates for whites and Asians but less than that for all black college graduates (7.1 percent).[12] Native Americans reported an unemployment rate

Figure 2-5. Unemployment rates by race: 1982



SOURCE: Appendix table 45.

Figure 2-6. S/E employment rates by race: 1982



SOURCE: Appendix table 45.

of about 1 percent. Between 1972 and 1982, the black-white differential in unemployment rates increased. In 1972, there was virtually no difference in unemployment rates between blacks and whites. The unemployment rate for black scientists and engineers is likely influenced by the relatively large proportion of women (about one-third) among blacks. The rate for black men (3.8 percent) was substantially below that for black women (5.9 percent) in 1982.

The variation in unemployment rates by race differs within specific fields (appendix table 45). Among computer specialists, for example, blacks and whites had similar unemployment rates in 1982 (about 1 percent). Controlling for field, however, the unemployment rate for blacks remains essentially unchanged, still roughly double the rate for whites.

At the doctoral level, black unemployment is higher than it is for other racial groups. Among doctoral scientists and engineers in 1981, blacks (1.4 percent) reported an unemployment rate similar to their Asian or white colleagues (roughly 1 percent). Among native Americans, the number of unemployed was too small to allow calculation of a meaningful rate.

For recent graduates at the bachelor's level, unemployment rates for blacks are substantially higher than those for whites or Asians. Among recent bachelor's recipients, 5.7 percent of the whites were unemployed. For blacks, the comparable figure was almost 14 percent; for Asians, it was about 4 percent. The higher unemployment rate for blacks partially reflects their concentration in the social sciences. In 1982, about two-thirds of the unemployed recent black S/E graduates at the bachelor's level had earned their degrees in the social sciences; among these graduates, the unemployment rate was over 20 percent. Among white social science graduates, 8 percent were unemployed. If social science graduates are eliminated from the analysis, the unemployment rate for blacks falls to about 8 percent (from almost 14 percent), and the rate for whites falls to about 5 percent (from 5.7 percent). At the master's level, unemployment rates were roughly similar for blacks and whites (about 3 percent).

S/E Employment Rates

The S/E employment rate measures the extent to which employed scientists and engineers are working in science or engineering jobs. A low rate could be an indication of underutilization, depending on the reasons for non-S/E employment.

Employed black scientists and engineers are somewhat less likely than whites and Asians to hold jobs in science or engineering (figure 2-6). The lower rate for blacks is influenced by the relatively large number of women among black scientists and engineers. In 1982, about 80 percent of the black women and 85 percent of the black men held jobs in science and engineering.

Across all races, S/E employment rates were lower for scientists than for engineers. Within major fields of science, S/E employment rates varied by race, with the rates for blacks generally below those for whites (appendix table 45). However, there were some exceptions. Black life scientists had an S/E employment rate above that for comparable whites, while the rates for black and white social scientists were essentially equal.

Among doctoral scientists and engineers, blacks and native Americans are less likely than either whites or Asians to hold jobs in science or engineering. In 1981, S/E employment rates for doctoral blacks and native Americans were 86 percent and 87 percent, respectively. Whites and Asians reported S/E employment rates of 92 percent and 93 percent, respectively. The lower S/E employment rate for blacks was not affected by the relatively large proportion of black doctoral women. Among black doctoral scientists and engineers, S/E employment rates for women and men were similar.

S/E employment rates among recent graduates at the bachelor's level vary considerably by race, with Asians having the highest rate. In 1982, the rate for Asians (71 percent) was above that for whites (61 percent) and for blacks (45 percent). Among social science graduates, about one-third of both the employed whites and blacks were in S/E jobs. Blacks, however, were more likely than whites or Asians to have earned their degrees in the social sciences.

Recent master's degree recipients are more likely than recent bachelor's degree recipients to hold jobs in science or engineering. At the master's level, Asians had a higher S/E employment rate (86 percent) than whites (73 percent) or blacks (60 percent). As with baççalaureate recipients, the lower rate for blacks partially reflects the concentration of black graduates in those fields where the S/E employment rates are relatively low for all races. The higher S/E employment rate for Asians results from the concentration of Asian graduates in engineering, where the rates are high regardless of race.

S/E Underemployment Rates

S/E employment rates and unemployment rates are only partial indicators of the extent to which those with S/E training and education utilize their skills. Some work outside of science and engineering, and some work part-time, by preference. An underemployment rate has been developed to help measure the degree of underemployment or underutilization. This rate shows those who are employed involuntarily in non-S/E jobs and those who are involuntarily working part-time as a percent of total employment.

Underemployment is relatively low among all scientists and engineers and varies in a narrow (2-4 percent) range by race. Underemployment was greater among scientists than engineers. Among scientists, underemployment rates averaged between 3 percent and 5 percent for whites, blacks, and Asians. Among engineers, underemployment rates were less than 1 percent among all racial groups. Regardless of race, most (60 percent) scientists and engineers who were underemployed were involuntarily working in non-S/E jobs.

S/E Underutilization

Underutilization rates for scientists and engineers vary by race, with the rate for blacks (8 percent) greater than the rates for whites (4 percent) or Asians and native Americans (5 percent for both). There was wide variation between engineers and scientists and among science fields. Underutilization among scientists (6 percent) was roughly twice that among engineers across all racial groups combined (appendix table 45). Underutilization rates for doctorate scientists and engineers were relatively low (1-3 percent) for all races, with considerable variation by field (appendix table 46).

HISPANIC SCIENTISTS AND ENGINEERS

Labor Force Participation Rates

In 1982, the labor force participation rate for Hispanics was 96 percent, roughly equal to that for all scientists and engineers. The participation of Hispanic scientists and engineers in the labor force is well above the 64 percent rate for both the overall U.S. and overall Hispanic populations,[13] as well as the 84 percent rate for Hispanic college graduates (87 percent for all college graduates).[14] Among doctorate scientists and engineers and among recent S/E graduates, Hispanics and non-Hispanics had similar labor force participation rates.

Unemployment Rates

Hispanic scientists and engineers are about as likely as all scientists and engineers to be employed rather than unemployed. In 1982, the unemployment rate for Hispanics was roughly equal to the rate for all scientists and engineers (2.3 percent). Unemployment among Hispanic scientists and engineers is much lower than among all Hispanics in the United States 25 years of age or older (10.9 percent)[15] and among all Hispanic college graduates (4.8 percent).[16] The unemployment rate for women Hispanic scientists and engineers was more than three times that for Hispanic men (5.8 percent vs. 1.8 percent).

The unemployment rate for Hispanic doctoral S/E's in 1981 was similar to that for all doctoral S/E's, about 1 percent. Almost all (about 90 percent) unemployed Hispanics with doctorates were psychologists and life and social scientists. However, less than 60 percent of the Hispanics were in those same fields.

S/E Employment Rates

Employed Hispanics are somewhat less likely than all S/E's to hold jobs in science or engineering. About [illegible] percent of the employed Hispanic S/E's held jobs in science and engineering in 1982, compared with 87 percent for all scientists and engineers. S/E employment rates for Hispanics varied between science and engineering and across fields of science (appendix table 45). The S/E employment rate for Hispanic scientists (73 percent) was well below that for Hispanic engineers (91 percent) but only somewhat lower than the rate for all scientists (80 percent).

Employed Hispanic doctoral scientists and engineers reported an S/E employment rate of about 90 percent, about the same as the rate reported by all doctoral S/E's. Hispanic men, however, showed a higher S/E employment rate than did Hispanic women (91 percent vs. 83 percent).

S/E Underemployment Rates

Hispanic scientists and engineers, on average, experience a higher degree of underemployment than all scientists and engineers. In 1982, the S/E underemployment rate (for definitions, see Technical Notes) for Hispanics was 3.4 percent, compared with 1.9 percent for all S/E's. Among scientists, Hispanics were also more likely than others to be underemployed (5.9 percent vs. 3.6 percent). Among engineers, the rate for Hispanics (1.7 percent) was again above that for the total (0.6 percent). At the doctoral level, the underemployment rate for Hispanic S/E's (about 1 percent) was roughly equal to that for all scientists and engineers.

S/E Underutilization

Hispanics, on average, experience a greater degree of overall underutilization than do non-Hispanic scientists and engineers. In 1982, the underutilization rate (for definitions, see Technical Notes) for Hispanics was almost 6 percent; for all scientists and engineers, it was about 4 percent.

At the doctoral level, the underutilization rate reported by Hispanics was about 50 percent higher than for all doctoral S/E's, 2.5 percent vs. 1.7 percent. The relatively high rate for Hispanics is due in large part to the substantially higher underutilization rates reported by Hispanics in the life and social sciences and psychology.

ENDNOTES

1. See Technical Notes for a description of how these various rates are constructed.

2. Data for all women are from U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings*, Vol. 30, No. 1, January 1983, p. 141. Data for college educated women are from U.S. Department of Labor, Bureau of Labor Statistics, *News*, USDL 82-276, August 10, 1982, Table 1.

3. Ibid.

4. *Employment and Earnings*, January 1983, p. 143.

5. See, for example, Jacob Mincer and Solomon Polachek, "Family Investments in Human Capital: Earnings of Women," *Journal of Political Economy*, Vol. 82, No. 2, Pt. 2, (1974), pp. 76-108; "Working Mothers in the 1970's," *Monthly Labor Review*, October 1979, pp. 39-49; "Labor Force Patterns of Single Women," *Monthly Labor Review*, August 1979, pp. 46-49; James E. Long and Ethel B. Jones, "Labor Force Entry and Exit by Married Women," *Review of Economics and Statistics*, February 1980, pp. 1-6; and "Back to School at 35 and Over," *Monthly Labor Review*, August 1979.

6. U.S. Department of Labor, *Employment and Training Report of the President*, 1982, p. 217. These rates are for married women with husband present.

7. *Employment and Earnings*, January 1983, p. 151.

8. *News*, USDL 82-276, Table 1.

9. See Michael G. Finn, "Understanding the Higher Unemployment Rate of Women Scientists and Engineers," *American Economic Review*, December 1983.

10. National Science Foundation, *Women and Minorities in Science and Engineering*, (NSF 82-302), Washington, D.C., 1982, p. 18. Although in widespread use, it should be noted that the use of multivariate statistical techniques to isolate the effects of selected variables on differences in earnings or other labor market indicators has been criticized. See, for example, Richard F. Kamalich and Solomon W. Polachek, "Discrimination: Fact or Fiction? An Examination Using an Alternative Approach," *Southern Economic Journal*, October 1982, pp. 450-461; and H. Roberts, "Statistical Biases in the Measurement of Employment Discrimination," in Robert Livernash, ed., *Comparable Worth: Issues and Alternatives*, (Washington, D.C.: Equal Employment Advisory Council, 1980), pp. 175-195.

11. See Technical Notes for a description of how these various rates are constructed.

12. *News*, USDL 82-276, Table 2.

13. *Employment and Earnings*, January 1983, p. 175.

14. *News*, USDL 82-276, Table 2.

15. *Employment and Earnings*, January 1983, p. 180.

16. *News*, USDL 82-276, Table 2.

CHAPTER 3

Education and Training

Women and minorities are underrepresented in science and engineering professions. In part, this underrepresentation reflects differences in patterns of participation exhibited by women and minorities compared with men and the majority in mathematics and science at all educational levels.

At the precollege level, science and mathematics education is pivotal in attracting and preparing students for further study in S/E fields. However, existing evidence suggests that women and minorities are not being attracted to science and mathematics to the same degree as men and the majority at this level. Among the variables that may be used to explore the pervasiveness of this evidence are curriculum placement, mathematics and science coursework, and scores on standardized tests measuring mathematics and science achievement.

Curriculum placement and coursework are important factors in that students in academic curriculums tend to take more mathematics and science coursework in high school than do other students. In addition, students exposed to more mathematics and science generally have higher scores on standardized tests such as the Scholastic Aptitude Test (SAT). The significance of SAT scores is twofold: (a) they are a crucial factor in college admissions decisions; and (b) "low" scores may limit a student's entry into a science or engineering field at the undergraduate level.

At the undergraduate and graduate levels, women and minorities do not participate in some science and engineering fields to the same extent as men and the majority. Possible sources of disparity are illuminated by examining patterns of degree production, graduate support status, and postdoctoral appointments in science and engineering fields. In addition, the quality of potential S/E graduate students is explored by reviewing Graduate Record Examination (GRE) scores.

Although standardized tests measuring mathematics and science achievement are used in this chapter as indicators of differing participation patterns, lower scores on these tests do not necessarily imply a lack of inherent ability. Test scores may also reflect a variety of social, demographic, and economic factors. For example, a disproportionate number of minority families are at lower economic levels, and there is a relationship between test scores and family income. Therefore, gross comparisons between minorities and the majority can give a distorted picture of inherent ability because other variables, such as family income and educational attainment of parents, are not standardized.[1]

In addition to women, data are presented, wherever possible, for three racial groups: blacks, Asians, and native Americans. Data for Hispanics are generally presented in aggregate form, although some data are available separately for Mexican Americans, Puerto Ricans, and Latin Americans and are included where practicable. Data for minority women and the physically handicapped are either not available or are only available for a limited number of variables. These two groups are therefore excluded from analysis in this chapter.

WOMEN

Precollege Preparation

Curriculum and Coursework

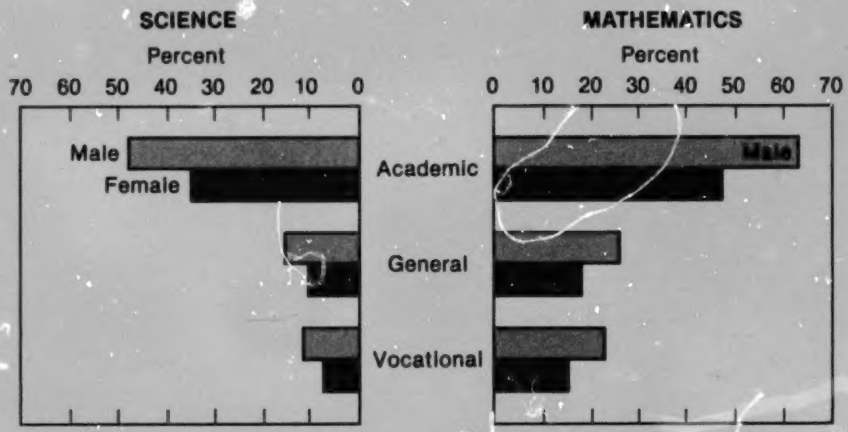
Curriculum placement is a significant factor in determining entrance into study in an S/E field at the undergraduate level. High school students in academic curriculums tend to take more mathematics and science courses, complete more honors-level mathematics courses, and achieve higher SAT scores than do students in either general or vocational curriculums.

Of all 1980 high school seniors, about two-fifths of both males and females were enrolled in academic programs.[2] Since 1972, the proportions in this curriculum have fallen for both sexes, with male enrollment (down 6 percentage points) declining more than female enrollment (down 2 points). When coupled with the projected decline in the number of high school graduates (between 1981 and 1991, the number of both male and female graduates is projected to decrease by about 22 percent[3]), this trend has implications for the future human resource pool.

Male students take more math and science courses in high school than do female students.[4] In 1980, two-fifths of the males compared with about one-quarter of the females had taken three or more years of mathematics. In science, one-quarter of the males and almost one-fifth of the females had taken three or more years of science in high school. Sex differences continue to arise when coursetaking is further stratified by curriculum. Males in academic curriculums take significantly more mathematics and science courses than do females (figure 3-1).

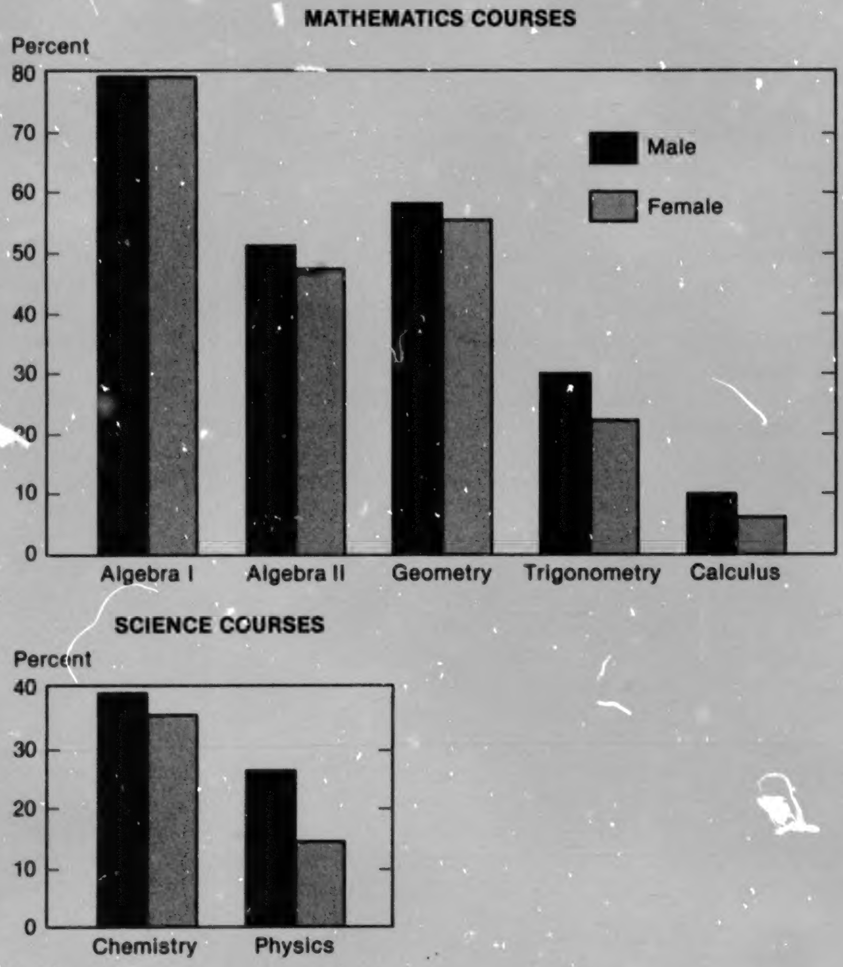
Statistics on the number and proportion of students taking mathematics courses can either understate or overstate the mathematics preparation of students, since some fraction of these students are taking remedial courses and still others are taking honors courses. Overall, about 30 percent of the 1980 high school seniors had taken remedial math courses while about 23 percent had been enrolled in advanced or honors math courses.[5] Male students were more likely to have taken more remedial and more honors mathematics courses than female students: remedial,

Figure 3-1. Percentage of high school seniors taking three or more years of mathematics and science by curriculum and sex: 1980



SOURCE: Appendix table 57.

Figure 3-2. Percentage of high school seniors taking mathematics and science courses by sex: 1980



SOURCE: Appendix table 58.

32 percent vs. 29 percent; and honors, 26 percent vs. 21 percent.

Both male and female "college-bound" seniors[6] are more often in academic curriculums than in either general or vocational programs. In 1981, about three-quarters of both college-bound males and females were enrolled in academic curriculums.[7] College-bound seniors took more mathematics and science courses than all high school seniors. Coursetaking differentials narrowed considerably between "college-bound" males and females. In 1981, 90 percent of the males compared with 82 percent of the females had studied mathematics for three years or more.[8] About the same proportion (8 percent) of males and females took three or more years of biological science coursework, but significantly more males (31 percent) than females (17 percent) took three or more years of physical science coursework.

Males and females also exhibit different coursetaking behavior regarding types of courses. Among high school seniors in 1980, about the same proportions of females and males took algebra I, while males were slightly more likely to have taken algebra II and geometry (figure 3-2).[9] Coursetaking differentials increase with more advanced mathematics courses. Only about two-thirds as many females as males had taken trigonometry and calculus.

Differentials also exist in science coursetaking (figure 3-2).[10] Males were slightly more likely to have taken chemistry in high school than females. The differential widens considerably in physics: male seniors were almost twice as likely as female seniors to have taken physics in high school in 1980.

Mathematics and Science Achievement

The National Assessment of Educational Progress (NAEP), funded by the National Institute of Education, is designed to determine the achievement levels of precollege students in a number of cognitive areas, including mathematics and science.[11] The objective of the assessments is to establish how specific groups of American students (e.g., males, females, urban dwellers) respond to academic exercises in each of these subjects rather than to measure the performance level of individual students. Response rates of the particular groups are assessed against a national average as well as between groups. Specifically, the national assessment of mathematics measures achievement on four sets of exercises: (a) knowledge of mathematical fundamentals; (b) computational skills; (c) understanding of mathematical methods; and (d) application of mathematical principles (i.e., problem-solving ability). The science assessment also contains four components: (a) knowledge and skills in content areas, such as biology, physical science, and earth science (science content); (b) understanding of scientific processes (inquiry); (c) the implications of science and technology for society (science-technology-society); and (d) students' orientation and feelings about science—primarily science classes (attitudes). Both assessments are administered periodically to three age groups (9-, 13-, and 17-year olds).

Table 3-1. Change in mean performance on the Mathematics Assessment by sex and age: 1982

Age and Sex	Overall mean score	Change in mean performance, 1978-82 (%)
9-year olds		
Males	55.8	+0.5
Females	56.9	+1.4[1]
13-year olds		
Males	60.4	+4.0[1]
Females	60.6	+3.7[1]
17-year olds		
Males	61.6	−0.4
Females	58.9	+0.1

[1]Change is significant at the 0.05 level.

SOURCE: Appendix table 60.

Results of the 1982 assessment of mathematics showed that at age 9, overall scores for females were higher than those for males (table 3-1). Disaggregating by component, females scored higher on the knowledge and skills sections, but males scored higher in the area of mathematical applications.[12] Between 1978 and 1982, the mean change in performance for females rose more than for males, partially reflecting the significant increase made by females on the knowledge component.

At age 13, overall mean scores for females and males were virtually the same (table 3-1). Nonetheless, component scores differed, with females again outperforming males on the skills section and males scoring higher on exercises pertaining to mathematical applications. Between 1978 and 1982, mean scores for both females and males rose significantly on all four components.

At age 17, overall mean scores for females were lower than those for males. By component, females scored lower on all four sets of exercises, with the largest differential occurring in the area of mathematical applications (appendix table 61). Between the 1978 and 1982 assessments, there was little change in mean performance by either females or males (table 3-1).

On the science assessment, the findings for females and males were similar to those on the mathematics assessment (table 3-2).[13] At age 9, females and males had similar scores on the inquiry and science-technology-society components, but males scored higher than females on the attitudes section in 1982 (a content component was not administered at this level). Since the 1977 assessment, overall scores for both females and males increased, resulting largely from significant increases on the science-technology-society component (appendix table 62a).

At age 13, the differential in scores between females and males was larger than at age 9, with males outperforming females on all four components. The greatest differences occurred on the content and the attitudes components (table 3-2 and appendix table 62a). There has been little change since the last assessment with the exception of the attitudes component. Scores on this component fell for both females and males.

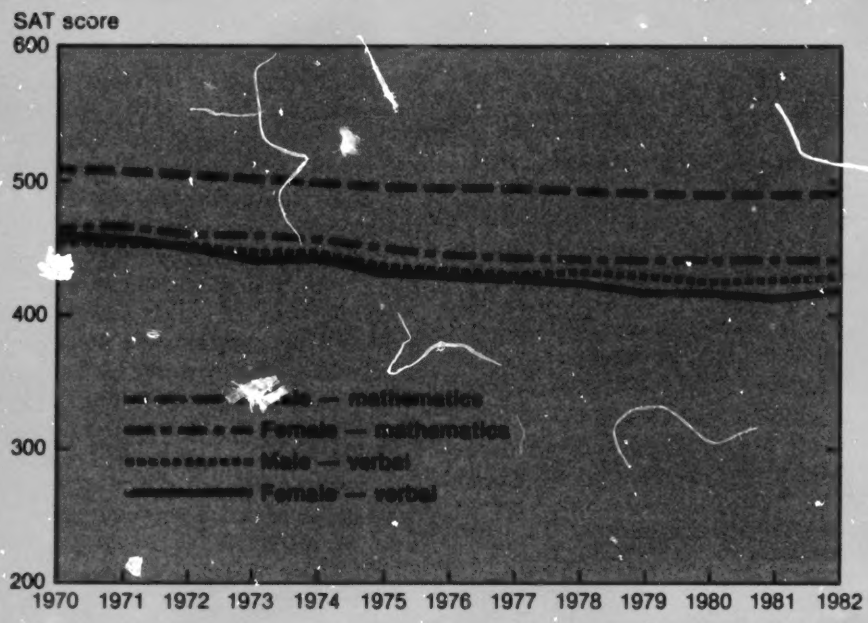
At age 17, males registered higher scores than females on all four components, with the most dramatic difference occurring on the content area (table 3-2). Underlying this difference was a much higher score for males on the physical science portion of the content component. Since 1977, significant declines for both sexes occurred on the content and inquiry components.

Table 3-2. Change in mean performance on the content and inquiry components of the Science Assessment by sex and age: 1982

	CONTENT		INQUIRY	
Age and Sex	Overall mean score	Change, 1977-82 (%)	Overall mean score	Change, 1977-82 (%)
9-year olds				
Males	[1]		52.8	−1.1
Females	[1]		53.5	−0.9
13-year olds				
Males	54.7	+0.3	58.5	−0.4
Females	50.2	−1.0	57.6	−0.8
17-year olds				
Males	62.7	−2.2[2]	70.2	−2.0[2]
Females	56.9	−1.7[2]	69.1	−2.4[2]

[1] A content component was not included in the Science Assessment for 9-year olds.
[2] Change is significant at the 0.05 level.
SOURCE: Appendix table 62a.

Figure 3-3. Scholastic Aptitude Test (SAT) scores by sex



SOURCE: Appendix table 63.

Characteristics of College-Bound Seniors

The Admissions Testing Program, a service of the College Board, offers both an aptitude test and an achievement test series to college-bound seniors. Both are critical elements in college admissions decisions. The Scholastic Aptitude Test (SAT) consists of a verbal and mathematics component; the former assesses reading comprehension and vocabulary skills, while the latter measures problem-solving ability using arithmetic reasoning and basic algebra and geometry skills.[14] The achievement test series includes one-hour multiple choice exams in thirteen academic subjects. About one in five of those students taking the SAT also takes one or more of the achievement tests. The score range for all components of both sets of tests is between 200 and 800.

SAT—Scores for males and females on both components of the aptitude test (SAT) have declined significantly over the past two decades. Between 1970 and 1982 alone, combined verbal and mathematics scores fell 44 points for males and 62 points for females.[15] However, between 1981 and 1982, scores for both males and females rose for the first time in two decades. In 1982, mathematics scores for females were 50 points below those for males, while female verbal scores were only 10 points lower (figure 3-3). These differentials do not change when students are further stratified by high school curriculum. Although students enrolled in academic curriculums generally have higher scores than do students in either general or vocational programs, males continue to have significantly higher scores in mathematics and slightly higher scores on the verbal component than females. In 1981, mathematics and verbal scores for male students in academic curriculums were 516 and 447, respectively, compared with 464 and 436 for female students.[16]

The percentile ranking for SAT combined scores (i.e., verbal and mathematics) discloses results that are similar to those summarized above for mean scores on the SAT components. About three-fifths (57 percent) of the females scored under 900, while only 5 percent scored 1,200 or higher in 1981.[17] In comparison, slightly less than half of the males (46 percent) scored under 900, and 10 percent had scores of at least 1,200.

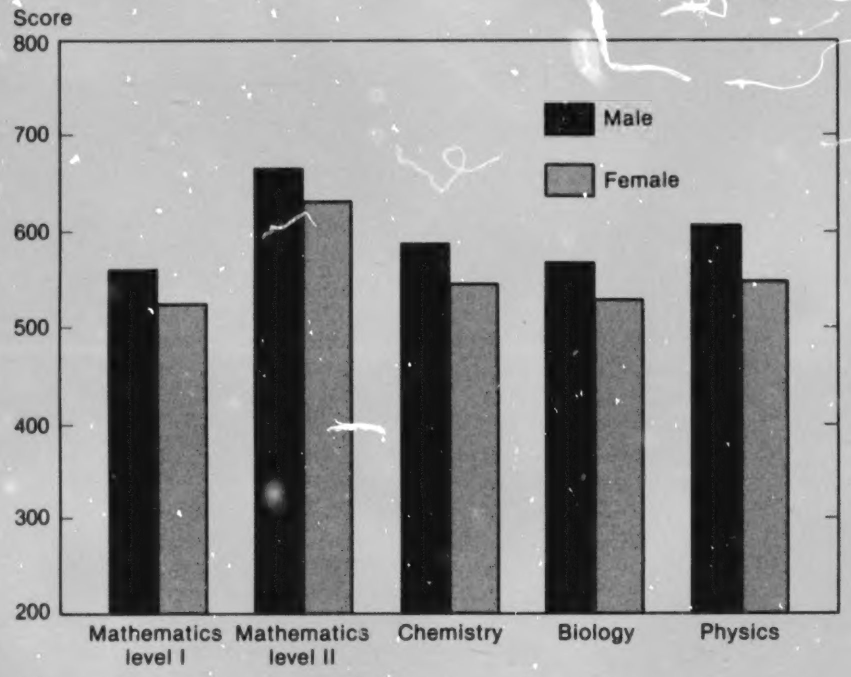
Achievement Test Scores—Although slightly over half of the college-bound seniors taking the SAT in 1981 were female, about 45 percent took one or more of the five achievement tests offered in math or science.[18,19] While about the same number of females and males took the mathematics level I test, twice as many males as females took the test in mathematics level II. Among the achievement tests in science, more females than males took the biology test, but significantly more males than females took the exams in chemistry and physics.

The scores for males on all five math and science achievement tests are consistently higher than those for females (figure 3-4). In addition, although all students who took math or science achievement tests in 1981 had SAT scores that were much higher than the average, male aptitude test scores were, again, consistently higher than the comparable scores for females. For example, the mathematics aptitude scores of males who took any of the five achievement tests in mathematics or science were from 20 to 60 points higher than females' scores. The score range for males was 573 to 657, compared with a range of 527 to 618 for females. Nonetheless, these scores were considerably above the overall mathematics scores for males (492) and females (443) in 1981.

Intended Undergraduate Major—When 1981 college-bound seniors were asked to specify their intended undergraduate major, females most often specified either business or health, while males were more likely to choose business or engineering. Almost 22 percent of the males and only 3 percent of the females indicated engineering as their probable field of study (figure 3-5). Likewise, males chose computer or physical science more often than females, and similar proportions intended to major in mathematics or the biological and social sciences (appendix table 66). A relatively low score on the mathematics component of the SAT could inhibit acceptance to colleges and universities for study in one of these science or engineering fields.

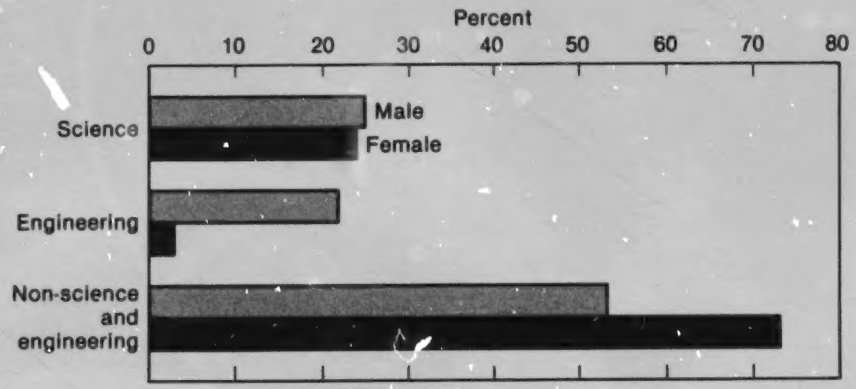
Mathematics scores for both males and females intending to major in either physical science or engineering were above average. Whereas males intending to major in mathematical, physical, or computer science had higher average scores than females, the reverse was true among prospective engineer-

Figure 3-4. Achievement test scores by sex: 1981



SOURCE: Appendix table 65.

Figure 3-5. Intended undergraduate major by sex: 1981



NOTE: Out of 29 choices for undergraduate field, seven were in science and one was in engineering.
SOURCE: Appendix table 66

ing majors (549 for females compared with 540 for males).[20]

Precollege Summary

Males appear to participate in mathematics and science at the precollege level significantly more often than do females. Although about the same proportions are enrolled in academic curriculums, males take more years of mathematics (including honors-level mathematics) and science in high school than do females; this trend is also evident among college-bound seniors.

Data, such as scores on standardized tests, also indicate that male and female students do not participate in math and science training to the same degree. Whereas there was little difference in assessment scores for males and females at younger ages (females outperformed males at age 9 on the mathematics assessment), by age 17, scores for males on the mathematics and science assessments were notably higher. Likewise, on the mathematics component of the SAT, scores for males were considerably higher than scores for females (50 points in 1982).

These differences have implications for future participation of females in science and engineering. For example, when college-bound seniors were asked to specify their intended area of undergraduate major, almost half the males, compared with slightly more than one-quarter of the females, chose an S/E field.

Undergraduate Preparation

The Graduate Record Examination (GRE), administered by the Educational Testing Service, is used in the admissions process by many graduate and professional schools as a supplement to undergraduate records. Like the SAT, the GRE contains a general aptitude test and offers advanced tests in twenty subject areas. The aptitude test consists of three components. The verbal component assesses the ability to use words in solving problems, while the quantitative portion measures the ability to apply elementary mathematical skills and concepts to solve problems in quantitative settings. The analytical component has been introduced in the last five years as a measure of deductive and inductive reasoning skills.

In 1982, scores for men and women were about the same on the verbal and analytical portions, but men scored higher on the quantitative component (figure 3-6). This differential persisted for those test-takers who majored in science or engineering fields.[21] However, there was wide variation by S/E field (appendix table 67). Differences in quantitative scores were not significant for men and women who majored in engineering at the undergraduate level, and women had somewhat higher verbal and analytical scores. In 1982, scores for women engineering majors were 492 (verbal), 653 (quantitative), and 590 (analytical), compared with 442, 658, and 522, respectively, for men. Reflecting low enrollments of women in engineering at the undergraduate level, only about 1,600 female engineering majors took the exam, compared with 13,100 males. In contrast, total figures for GRE test-takers were 95,900 women and almost 83,000 men.[22]

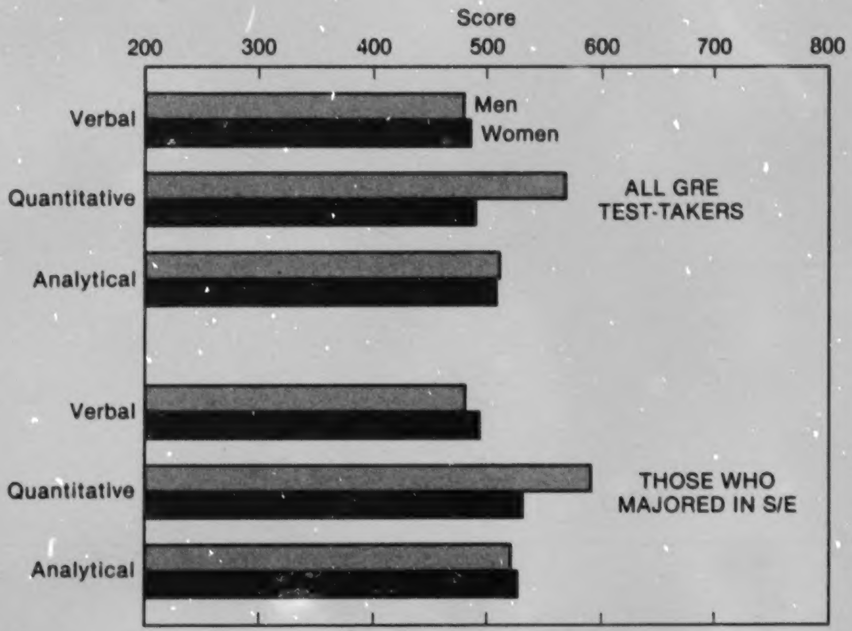
Trends in GRE test scores have been relatively stable over the last four years, varying within a range of about 5 to 25 points for both men and women who majored in science or engineering. Between 1979 and 1982, scores for both men and women declined slightly on the verbal component and rose on the quantitative and analytical components for successive years.

GRE test scores suggest that men and women who intend to enter graduate school in science or engineering have an equal probability of scholastic success. Even though men tend to score higher than women on the quantitative component, scores for women are well within one standard deviation of the scores for men.[23] That is, mean scores for females are not substantially different from the mean scores of males.

Earned Degrees

Women earn proportionally fewer degrees in science and engineering than do men. Although women represented about one-half of total enrollment in

Figure 3-6. Graduate Record Examination (GRE) scores by sex: 1982



SOURCE: Appendix table 67.

higher education institutions[24] and earned one-half of all degrees, they accounted for only 35 percent of the degrees (including advanced degrees) awarded in science and engineering in 1981. These figures, though indicative of continued underrepresentation of women, reflect gains at all educational levels since 1970.

Bachelor's Degrees—At the bachelor's level, women are earning more science and engineering degrees than in previous years. Over 108,000 S/E bachelor's degrees were awarded to women in 1981, an increase of almost 60 percent since 1970. In contrast, the number of S/E degrees earned by men fell by almost 5 percent during the same period, from about 195,000 in 1970 to 186,000 in 1981. Between 1970 and 1981, the proportion of S/E bachelor's degrees earned by women increased from 26 percent to almost 37 percent (the proportion of all women who earned baccalaureates rose from 42 percent to 50 percent). The representation of women rose significantly in all S/E fields except the mathematical sciences. However, the fact that the proportion of women who earned mathematical science degrees remained constant masks a sizable increase in the proportion of women who earned degrees in computer science. For example, in the last five years alone, women who earned bachelor's degrees in this field rose from 20 percent of the total to 33 percent.

Other significant proportional increases are apparent in those fields where the representation of women has been small. In 1981, women accounted for 11 percent of the engineering baccalaureates awarded, up from less than 1 percent in 1970. In absolute terms, the number of degrees awarded rose from about 340 to over 7,100. In the physical sciences, the number of degrees earned by women doubled, from 3,000 to almost 6,000 over the 11-year period. This absolute increase in physical science degrees resulted in a proportional rise from 14 percent in 1970 to 25 percent in 1981.

Even though there have been substantial increases in the number of bachelor's degrees in engineering and the physical sciences earned by women, most women earn their degrees in the social sciences (including psychology). In 1981, almost 52 percent of the degrees awarded in these fields went to women, up from 37 percent in 1970.

Advanced Degrees—The general trends in S/E master's and doctoral degree production parallel that in S/E bachelor's degrees earned. While the number of degrees awarded to women rose steadily between 1970 and 1981, the number earned by men declined, leading to a substantial increase in the proportion of S/E degrees earned by women across all fields. In 1981, women earned 27 percent (up from 17 percent) of the S/E master's degrees and 23 percent (up from 9 percent) of the S/E doctorates. Although these proportions indicate significant improvement, they are still well below the proportions of all master's and doctoral degrees awarded. In the same year, women earned over one-half of the total number of master's degrees and almost one-third of all doctorates.

Substantially more master's degrees in science and engineering are being granted to women than was the case in the past. There were over 15,000 S/E master's degrees awarded to women in 1981, up from 8,600 in 1970. Almost one-half these degrees were granted in the social sciences (including psychology), and another one-fifth were given in the life sciences. Substantial gains were made in engineering: in 1981, women accounted for 8 percent of the total number of engineering master's degrees granted, an eightfold increase since 1970 (from 170 to 1,400).

Women are also making substantial gains at the doctoral level in all S/E fields. Between 1970 and 1982, degrees awarded to women in the life and social sciences almost tripled. These two fields accounted for over four-fifths of the 4,100 S/E doctorates awarded to women in 1982. A significant increase was also made in the number of engineering doctorates conferred on women, which rose from 15 in 1970 to 124 in 1982. While this increase is numerically small, it represents an eightfold increase in twelve years. In 1982, 124 engineering doctorates were earned by women, up from only 15 in 1970. Despite this increase, the number of engineering doctorates awarded to women represents less than 5 percent of the total number of engineering doctorates conferred in 1982.

Graduate Degree Attainment Rates

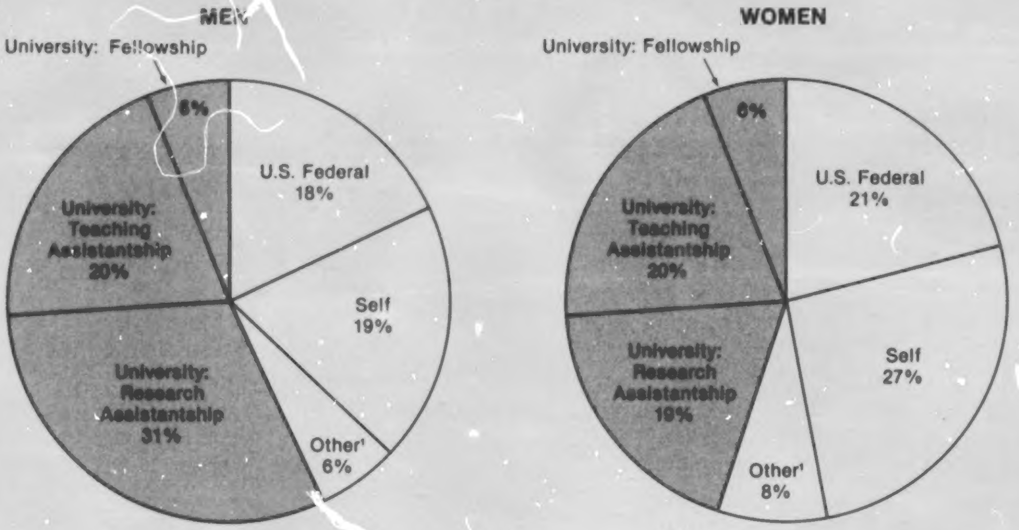
Additional evidence of the significant gains made by women at all educational levels may be inferred by examining graduate degree attainment rates, i.e., the propensity of men and women to complete graduate degrees. Graduate degree attainment rates are defined as S/E master's degrees expressed as a percent of S/E bachelor's degrees awarded two years earlier and S/E doctorate degrees expressed as a percent of S/E bachelor's degrees awarded seven years earlier.

Over the last decade, the S/E master's degree attainment rate has fallen for men and risen slightly for women. However, the rate for women is still only about two-thirds the rate for men (up from three-fifths in 1972). In 1981, respective rates were 14.7 percent and 21.4 percent (excluding engineering, the rates for women and men were 13.4 percent and 18.4 percent, respectively).

The S/E doctoral degree attainment rate was also higher for men than for women. In 1981, the rate for women was 4.3 percent, compared to 6.4 percent for men (excluding engineering, the rates were 4.4 percent for women and 6.6 percent for men). The overall differential has narrowed considerably since 1972. Between 1972 and 1981, the rate for men fell by almost one-half from 13.1 percent, while the women's rate declined by about one-quarter from 5.8 percent. The trends in degree production underlying these changes are very different. The decline in the rate for men resulted primarily from an absolute decline in S/E doctoral degree production. In contrast, the women's rate fell because increases in S/E baccalaureate production considerably outpaced increases in S/E doctoral degree production.

Another way to summarize sex differences in degree production at the doctoral level is through the application of two parity indices.[25] The first, PI_1, assesses the extent to which the field distribution of women approximates that of men; the second, PI_2, measures the propensity of women baccalaureates in a given field to earn

Figure 3-7. Major source of graduate support for 1982 doctorate recipients by sex



¹Includes U.S. non-Federal, Business & Industry, Loans, and other.

SOURCE: Based on Appendix table 75.

doctorates after a time interval appropriate to a particular field, relative to the comparable population of men. A ratio of more or less than 1.00 in PI_1 indicates that the proportion of female degree recipients in that field is, respectively, more or less than that of men, while a ratio of more or less than 1.00 in PI_2 shows whether women are, respectively, more or less likely than men to complete a doctorate in a given field.

In 1982, the PI_1 index was under 1.00 for women in engineering and the physical and mathematical sciences but over 1.00 for those in the life and social sciences (appendix table 73). In the social sciences, the ratio measured 1.57, indicating that women were much more (57 percent) likely than men to earn their degrees in these fields. In contrast, the index was only 0.20 for engineering.

The overall PI_2 index for 1982 was 0.74, indicating that women were somewhat less likely than men to earn their doctorates within a field-specific time interval (appendix table 73). However, there was wide variability by field. The ratio for women in engineering was 1.27, while in the mathematical sciences it was 0.34. The indication is that female engineering majors are more likely (27 percent) than male engineering majors to receive their engineering doctorates within a given time interval. However, the opposite is true among male and female mathematical science majors.

Graduate Support Status

Sources of support for graduate education can illuminate potential areas of disparity between men and women. In other words, the amount and type of support received may act to stimulate or inhibit further study in an S/E field.

For those who received a doctorate in a science or engineering field in 1982, both men and women reported universities as their primary source of support more often than any other sources (figure 3-7). However, a substantially larger share of men than women reported this source, 57 percent vs. 45 percent.[28]

Although a substantial number of both men and women receive university support, there are differences in the type of support secured. Of the women receiving university aid, about the same proportions held research and teaching assistantships. Comparatively, men were much more likely to hold research (55 percent) rather than teaching (35 percent) assistantships. On a field-specific basis, however, differences in the type of assistantship held narrow. For example, of those receiving degrees in the physical sciences, men (64 percent) were only slightly more likely than women (59 percent) to hold research assistantships. On the other hand, half of both the men and women receiving social science or psychology degrees held teaching assistantships. In 1982, women who had received university support were twice as likely as men to have earned their S/E doctorate in either psychology or the social sciences: 42 percent vs. 21 percent. Thus, overall differences in type of support held may partially reflect differing field distributions.

Postdoctoral Appointments

One indication of the increasing number of women earning doctorates in science and engineering is the significant increase in the proportion of women holding postdoctoral appointments in these fields. Between 1973 and 1981, the number of women holding postdoctoral appointments rose from less than 900 to almost 2,800, representing an annual growth of almost 16 percent. In contrast, the annual growth rate for men was about 6 percent, rising from 4,800 to 7,800. As a result of these differential growth rates, the proportion of all postdoctoral appointments in science and engineering held by women increased from 15 percent in 1973 to 26 percent in 1981. Specifically, women have made sizable proportional gains in the life and social sciences (including psychology). In the life sciences, the ratio of women holding postdoctoral appointments to the total rose from 21 percent to 30 percent between 1973 and 1981; in the social sciences, the increase was from 24 percent to 45 percent. If those holding postdoctoral appointments in psychology are excluded from the social sciences, the proportional gain is from 12 percent to almost 53 percent.

The field distribution of those on postdoctoral appointments varies considerably among men and women. Over 72 percent (2,000 appointments) of the women took appointments in the life sciences, another 14 percent (380) held appointments in the social sciences (including psychology), and about 12 percent (340) held postdoctorates in the physical sciences. Among men, 60 percent (4,700) of their appointments were in the life sciences and 27 percent (2,100) were in the physical sciences.

A study by the National Academy of Sciences[27] reported that men and women take postdoctoral appointments for about the same reasons. Their primary reason is to gain research experience. Other reasons cited include (a) the opportunity to work with a particular scientist or research group; (b) the chance to transfer into different fields; and (c) the inability to secure employment. Very few men or women reported the final reason as the major incentive for taking these appointments. Nevertheless, of the men and women taking postdoctoral appointments in chemistry, men were significantly more likely than women to report inability to obtain employment.[28]

Women were somewhat more likely to hold long-term (more than 36 months) appointments than men: 23 percent vs. 18 percent. About the same proportion, approximately 30 percent, of both cited difficulty in finding employment as the major reason for holding these long-term postdoctorates. Married women and single men reported this difficulty much more often than did single women or married men.

Geographic constraints are a much more significant element in women's decisions to take postdoctorates than men's. Over one-half of the women reported geographic limitations as an "important" factor, compared with about one-quarter of the men. The substantially higher percentage of women reporting this limitation was underscored by married women: 70 percent of the married women compared with only 33 percent of the single women cited geographic constraints as an important factor in taking postdoctoral appointments.[29]

RACIAL MINORITIES

Precollege Preparation

Curriculum and Coursework

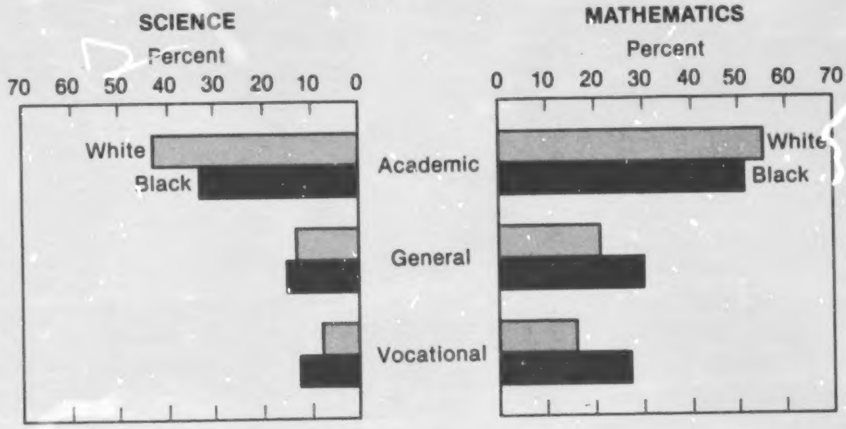
Whites are more likely than blacks to be enrolled in academic curriculums. Of the 1980 high school seniors, 40 percent of the whites compared with 33 percent of the blacks were in such programs.[30] In the same year, about 31 percent of the blacks and 23 percent of the whites were in vocational programs. In general programs, enrollment of blacks and whites was about the same: 35 percent and 37 percent, respectively.

Consistent with overall trends, both blacks and whites in academic curriculums complete more years of mathematics and science than blacks and whites in either general or vocational programs (figure 3-8). Of those seniors participating in academic programs, 55 percent of the whites and 51 percent of the blacks took three or more years of mathematics, while 43 percent of the white students and 33 percent of the black students took three or more years of science coursework.

Even though students in general and vocational curriculums tend to take fewer science and mathematics courses than students in academic curriculums, blacks in these programs reported taking more years of coursework in mathematics and science than their white counterparts. For example, in 1980, 30 percent of the blacks enrolled in general studies had taken three or more years of mathematics compared with 21 percent of the whites.[31]

The differences among black and white seniors in general and vocational

Figure 3-8. Percentage of high school seniors taking three or more years of mathematics and science by curriculum and race: 1980



SOURCE: Appendix table 57.

programs are not as large when total years of science coursework completed is considered. For example, for seniors enrolled in general curriculums in 1980, 15 percent of the blacks and 13 percent of the whites had taken three or more years of science.

The number of remedial and advanced mathematics courses taken differs significantly between whites and other racial groups. For all white high school seniors in 1980, about 29 percent had taken courses in remedial mathematics.[32] Comparatively, 34 percent of the blacks, almost 42 percent of the native Americans, and only 22 percent of the Asians had taken such remedial coursework. Examining the number of advanced (honors) mathematics courses taken by high school seniors in 1980, Asians were much more likely to have been enrolled in such courses. Almost 42 percent of the Asians, compared with 23 percent of the whites, reported taking advanced mathematics courses. Blacks and native Americans took this advanced coursework less often than whites: about one-fifth of the students in each of these racial groups.

Although curriculum data for all high school seniors are not available for Asians and native Americans, data are available for Asian and native American college-bound seniors. Most of the seniors who take the SAT are in academic curriculums. In 1981, a higher proportion of whites than of other racial groups were enrolled in this curriculum. About 73 percent of the Asians, 68 percent of the native Americans, and 62 percent of the blacks were in this curriculum, compared to 79 percent of the whites.[33]

Table 3-3. Percentage of high school seniors taking mathematics and science courses by race: 1980

Course	White	Black	Asian	Native American
Algebra I	81	68	88	61
Algebra II	50	39	76	32
Geometry	60	38	79	34
Trigonometry	27	15	50	17
Calculus	8	5	22	5
Physics	20	19	35	17
Chemistry	39	28	59	24

SOURCE: Appendix table 59.

Table 3-4. Change in mean performance on the Mathematics Assessment by race and age: 1982

Age and race	Overall mean score	Change in mean performance 1978-82 (%)
9-year olds		
Whites	58.8	+0.7
Blacks	45.2	+2.1
13-year olds		
Whites	63.1	+3.2
Blacks	48.2	+6.5[1]
17-year olds		
Whites	63.1	−0.2
Blacks	45.0	+1.3

[1] Change is significant at the 0.05 level.
SOURCE: Appendix table 61.

Differences among racial groups also emerge when coursetaking in specific mathematics and science courses is surveyed. Among 1980 high school seniors, whites were much more likely to have taken algebra I, algebra II, geometry, and trigonometry than either blacks or native Americans (table 3-3). However, the proportion of Asians who had taken these courses was much higher than for whites. The differences widen with more advanced coursework. For example, while most seniors in all racial groups took algebra I—ranging from three-fifths of the native Americans to almost nine-tenths of the Asians[34]—substantially fewer students, with the exception of Asians, had taken trigonometry. In 1980, 27 percent of the whites, 17 percent of the native Americans, and 15 percent of the blacks had taken a trigonometry course, compared with 50 percent of the Asian students. Additionally, Asians were more likely to have taken chemistry and physics courses. Almost three-fifths of the Asians, compared with about two-fifths of the whites and only about one-quarter of the blacks and native Americans, had taken a chemistry course in high school.

Mathematics and Science Achievement

The National Assessment of Educational Progress periodically designs and administers testing instruments in a number of cognitive areas to establish how specific groups of students respond to academic exercises. The assessments are not used as a measure of individual student performance. The results from the latest assessment of mathematics (1982) showed that blacks continued to score well below their white counterparts (table 3-4).[35] At age 9, the difference was 14 percentage points; at age 13, it was 15 points; and at age 17, the gap was 18 percentage points.[36] Due to the gains made by blacks since the last assessment, these differences have narrowed. In 1978, score differentials between blacks and whites were 15 percentage points (9-year olds), 18 points (13-year olds), and almost 20 points (17-year olds).[37]

At age 9, overall mean scores for

Table 3-5. Change in mean performance for males and females on the content and inquiry components of the Science Assessment by race and age: 1982

Sex, age, and race	CONTENT Overall mean score	CONTENT Change, 1977-82 (%)	INQUIRY Overall mean score	INQUIRY Change, 1977-82 (%)
MALES				
9-year olds				
White	[1]		55.9	− 1.3
Black	[1]		40.8	+ 3.4
13-year olds				
White	56.8	− 0.2	60.4	− 0.8
Black	44.6	+ 2.4	48.8	+ 0.6
17-year-olds				
White	65.6	− 1.7	72.8	− 2.6[2]
Black	47.8	− 1.8	58.1	− 0.1
FEMALES				
9-year olds				
White	[1]		55.3	− 1.7
Black	[1]		41.4	+ 1.9
13-year olds				
White	52.4	− 1.2	59.7	− 1.1
Black	40.6	− 0.8	49.3	+ 0.1
17-year olds				
White	59.3	− 1.8	71.6	− 2.5[2]
Black	44.4	− 1.3	56.7	− 1.9

[1] A content component was not included in the Science Assessment for 9-year olds.

[2] Change is significant at the 0.05 level.

SOURCE: Appendix table 62b.

both blacks and whites increased, with blacks' scores rising twice as much as those for whites. The major impetus behind this higher increase was the significant rise in scores on the knowledge component (appendix table 61).

The largest increases for both blacks and whites were at age 13. Again, the increase in overall mean scores for blacks was double that for whites. Disaggregating by component, the increases for blacks were at least twice those for whites on all four components with the largest difference occurring on the knowledge component (appendix table 61).

The smallest changes on the mathematics assessment occurred for both blacks and whites at age 17. While scores for blacks were up slightly, those for whites remained relatively steady. By component, mean scores for blacks were up on the knowledge and skill components, but remained virtually unchanged on the understanding and applications sections. For whites, mean scores remained relatively stable on the knowledge, skill, and understanding components, but were down on the applications section.

On the science assessment, the available data are disaggregated by sex between whites and blacks.[38] Among 9-year olds, regardless of sex, whites scored higher than blacks on all three components (a content component was not administered) of the assessment in 1982, with the largest differential occurring on the inquiry component. Score differentials have narrowed since 1977 on all three components. The most dramatic changes took place on the inquiry component, where they moved in opposite directions for whites and blacks (table 3-5).

Among 13-year olds, whites scored higher than blacks on three components, with little change since 1977. However, on the attitude component, blacks scored higher than whites, regardless of sex (appendix table 62b). On this component, scores have declined significantly for whites since 1977.

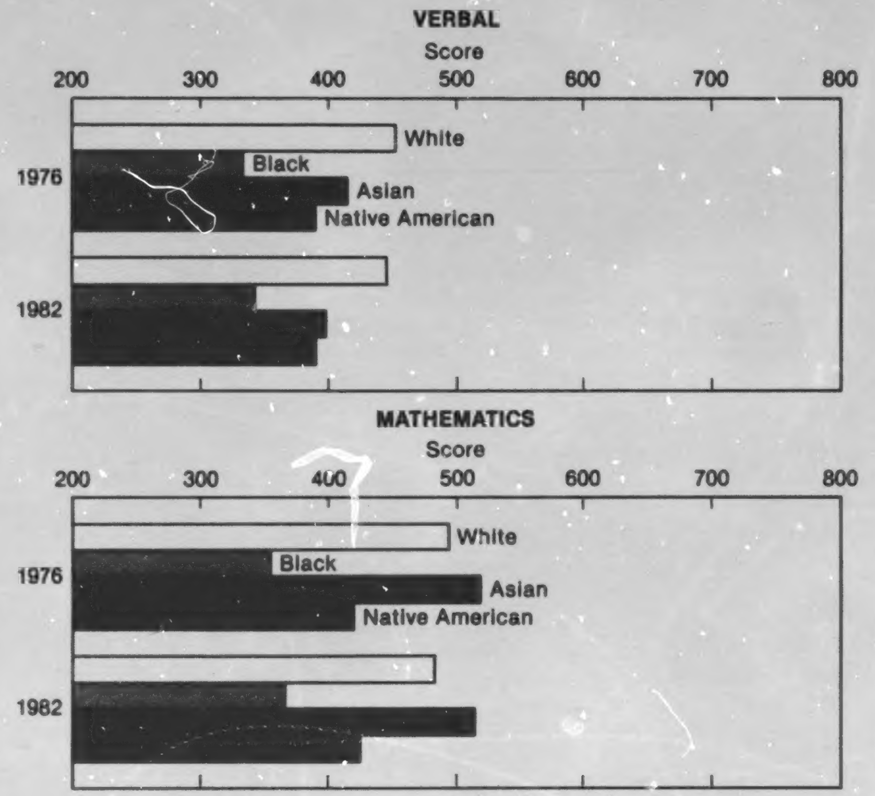
This same pattern occurred at age 17 but to an even greater extent. Scores for whites were higher than for blacks on the content, inquiry, and science-technology-society components, while blacks scored higher on the attitude component. On the attitude component, the score differential between black and white females was twice that between black and white males (appendix table 62b). Since 1977, the greatest change occurred on the inquiry component. Scores for whites declined significantly, while those for blacks declined but to a lesser degree (table 3-5).

Characteristics of College-Bound Seniors

SAT—Although blacks and native Americans have scored consistently lower than whites on both the verbal and mathematics components of the SAT, they have made gains in recent years (figure 3-9). In 1982, blacks scored 117 points (366) lower on the mathematics component than whites; the differential in their verbal scores was 103 points (341).[39] Since 1976, their scores have narrowed by about 20 points on each SAT component. Precipitating this narrowing in scores was a decline in white scores on both components contrasted with an increase in black scores on both components. The differential was somewhat lower for native Americans, who scored 59 points lower on the mathematics portion (424) and 56 points lower on the verbal portion (388) than whites in 1982. These differentials have narrowed somewhat since 1976. However, unlike the trend for blacks, SAT scores for native Americans remained relatively constant over the 1976-82 period.

Scores for Asians were consistently higher than those for whites on the mathematics component. Between 1976 and 1982, Asian scores averaged approximately 27 points higher on this portion of the aptitude test. In 1982, Asians registered an average mathematics score of 513, compared with 483 for whites. Over the 6-year period, Asian math scores

Figure 3-9. Scholastic Aptitude Test (SAT) scores by race



SOURCE: Appendix table 64.

46

fell but less than those of whites. On the verbal component, whites scored higher than Asians (444 vs. 398). In contrast to the trend in mathematics scores, SAT verbal scores among Asians fell faster than those among whites between 1976 and 1982.

Similar conclusions about racial differentials in mathematics scores can be gleaned from the percentile ranking on the mathematics component of the SAT. While 8 percent of the Asians and 5 percent of the whites scored above 650, only 2 percent of the native Americans and 1 percent of the blacks scored above this mark in 1981.[40]

Achievement Test Scores—Proportionally fewer blacks and native Americans and more Asians took achievement tests in mathematics and science than took the aptitude portion of the SAT. Of the approximately 275,000[41] college-bound seniors who reported taking achievement tests in one or more of the five mathematics and science subjects in 1981, about 6 percent were Asian, 3 percent were black, and less than 0.3 percent were native American. In contrast, of the students who answered the "ethnic backgound"[42] question on the SAT questionnaire, slightly over 3 percent were Asian, 9 percent were black, and 0.6 percent reported their racial/ethnic background as native American.[43]

Asians scored higher than either whites, blacks, or native Americans on all five of the mathematics and science achievement tests (table 3-6). In addition, Asians who took these tests had higher scores than any of the other three racial groups on the mathematics component of the aptitude test. For example, Asians who took the mathematics level II achievement test registered an average SAT math score of 653. Comparable scores for whites were 646, while blacks and native Americans scored 547 and 595, respectively (appendix table 65).

Intended Undergraduate Major—Among all possible fields of study,[44] Asians are much more likely than whites to choose an S/E field; blacks and native Americans are equally as likely to choose S/E fields as whites (figure 3-10). In 1981, almost 44 percent of the Asians, compared with 36 percent each of the whites, blacks, and native Americans, specified an S/E field as their intended major.[45] This higher propensity among Asians to choose an S/E field was due to the significantly greater proportion of Asians who chose engineering. About one in five of the Asians intended to major in this subject compared to approximately one in eight of the whites, blacks, and native Americans.

SAT mathematics scores for blacks and native Americans intending to major in an S/E field are lower than the scores for their white and Asian counterparts. In 1981, SAT mathematics scores for blacks ranged from 344 (social sciences) to 418 (physical sciences), those for native Americans fell to within the 398 (psychology) to 508 (physical sciences) range, while Asians scored between 492 (psychology) and 622 (physical sciences). In comparison, mathematics scores for whites were from 459 (psychology) to 591 (mathematics).[46]

Precollege Summary

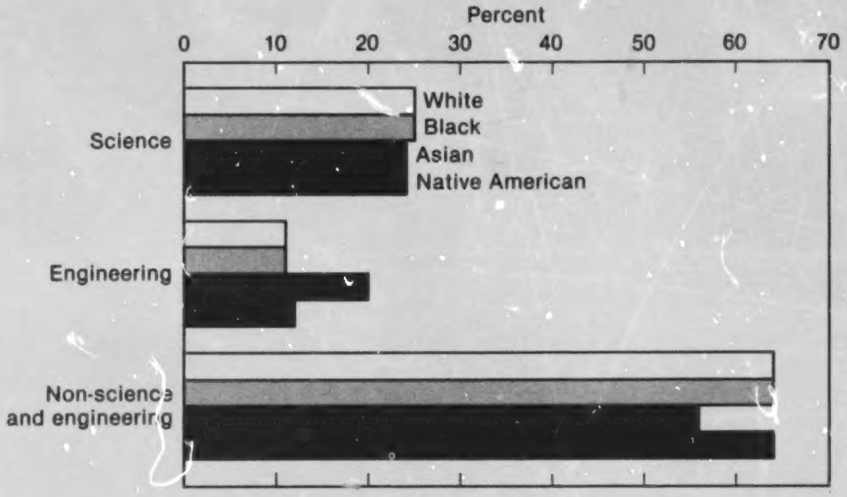
At the precollege level, patterns of participation in mathematics and sci-

Table 3-6. Achievement test scores by race: 1981

Subject	White	Black	Asian	Native American
Mathematics level I	543	477	571	506
Mathematics level II	655	574	676	604
Chemistry	571	503	595	535
Biology	546	470	566	509
Physics	597	515	607	569

NOTE: Score range of achievement tests from 200 to 800.
SOURCE: Appendix table 65.

Figure 3-10. Intended undergraduate major by race: 1981



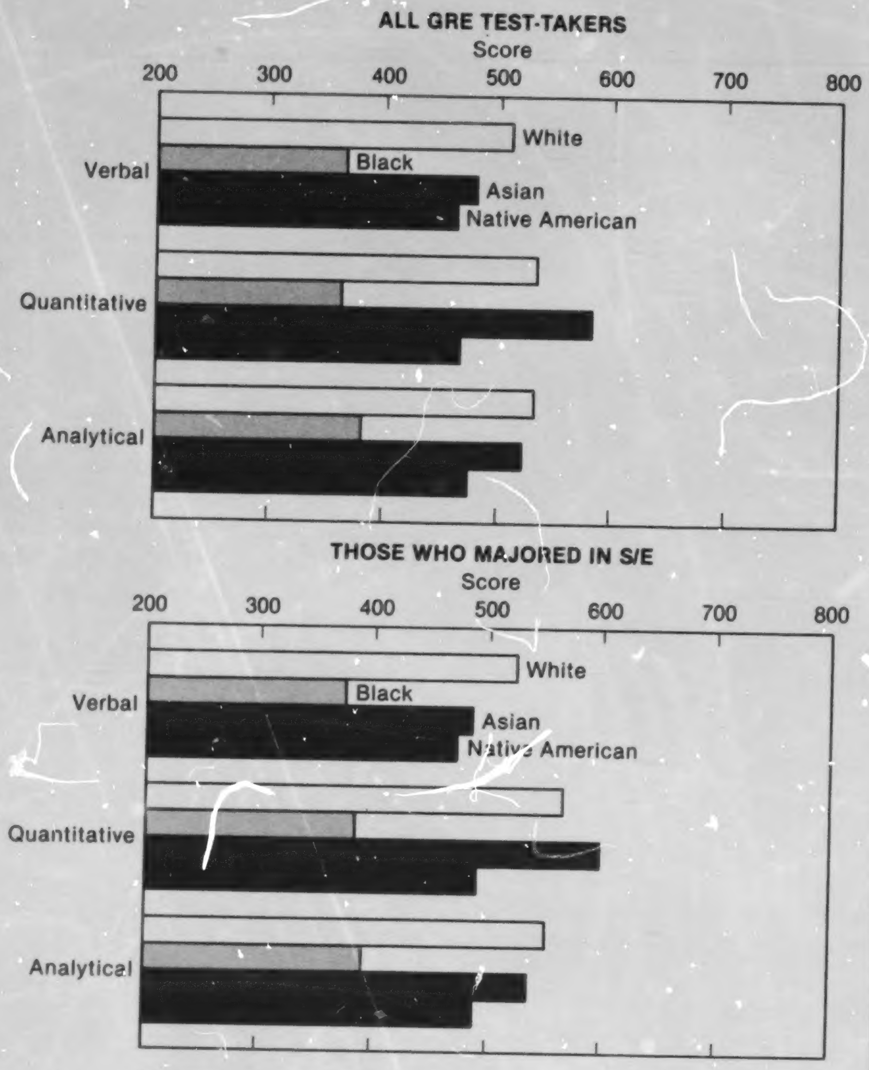
NOTE: Out of 29 choices for undergraduate field, seven were in science and one was in engineering.
SOURCE: Appendix table 66.

ence differ between blacks and whites. One underlying reason is that a substantially larger share of white than black high school seniors are enrolled in academic curriculums (i.e., those likely to entail a high degree of exposure to mathematics and science coursework). However, even for those high school seniors in academic programs, a higher proportion of whites than blacks took at least three years of mathematics and/or science coursework in high school.

Whites score consistently higher than blacks on tests assessing mathematics and science achievement at all age levels. On both the mathematics and science assessments, the gap widens with age; that is, by age 17, scores for whites are considerably higher than those for blacks. Whites also score higher than blacks on the mathematics component of the SAT. In addition, whites scored higher on the mathematics component than native Americans, although the differential was only one-half that reported between whites and blacks. Asians scored consistently higher (about one-fifth) than whites on the mathematics component.

These differences may indicate that native Americans, and especially blacks, are not receiving the same amount of precollege training in mathematics and science as whites and Asians. Such a deficiency can severely limit entry into an undergraduate science or engineering program.

Figure 3-11. Graduate Record Examination (GRE) scores by race: 1982



SOURCE: Appendix table 67.

Undergraduate Preparation

Of those taking the GRE who majored in a science or engineering field at the undergraduate level, whites scored consistently higher than blacks, Asians, and native Americans on the verbal and analytical components of the aptitude test.[47] Concurrently, Asians generally scored higher on the quantitative component. Regardless of racial group, test-takers who majored in S/E fields had higher GRE scores than all test-takers combined (figure 3-11).

The proportions of black and Asian test-takers are significantly less than the comparable proportions of college-bound seniors who take the SAT. In 1982, slightly more than 6 percent of the GRE test-takers reported their racial/ethnic group as black (9 percent for the SAT), and less than 2 percent reported being Asian (more than 3 percent for the SAT).[48] However, these proportions rise when considering those test-takers who majored in an S/E field: almost 7 percent were black and 2 percent were Asian.[49] The proportion of test-takers who were native American was approximately 0.7 percent for all test-takers and for those who majored in S/E fields at the undergraduate level (0.6 percent for the SAT).

Among the four racial groups, GRE score variation for test-takers who majored in science and engineering is greatest on the quantitative component and least on the verbal component. In 1982, verbal scores fluctuated by approximately 1.5 standard deviations,[50] with the largest differential occurring between whites and blacks. Whites scored 149 points higher than blacks, 39 points higher than Asians, and 50 points higher than native Americans. Between 1979 and 1982, there was only a slight fluctuation in verbal scores within all racial groups.

Quantitative scores differed by almost 2 standard deviations. For those test-takers who majored in science and engineering, Asians scored 40 points higher than whites (606 vs. 566), while native Americans scored 74 points lower and blacks scored 184 points lower. Since 1979, scores on this component have risen among all racial groups, ranging from a 7-point increase for blacks to a 16-point increase for native Americans. For all racial groups, test-takers who majored in engineering generally had higher scores than test-takers who majored in other S/E fields. In 1982, quantitative scores for engineering majors were 679 (whites), 676 (Asians), 649 (native Americans), and 565 (blacks) (appendix table 67).

On the analytical component, the largest differential for test-takers who majored in science and engineering occurred between whites and blacks—about 1.5 standard deviations. Scores ranged from 393 for blacks to 552 for whites in 1982. Asians and native Americans registered analytical scores of 537 and 490, respectively. Between 1979 and 1982, scores on this component rose for all racial groups, but with wide variation. While scores for whites rose 5 points, scores for blacks were up 8 points, those for Asians increased by 13 points, and the change in native American scores was 19 points.

Earned Degrees

Blacks, Asians, and native Americans earn a small fraction of the degrees in science and engineering. In comparison with more comprehensive statistics, this fraction is disproportionately low for blacks and native Americans. In 1981, blacks earned 6 percent (18,811) of the S/E bachelor's degrees, 4 percent (1,787) of the master's degrees in S/E, and about 2 percent (316) of the S/E doctorates. In comparison, blacks accounted for 10 percent of overall undergraduate enrollment and 5 percent of graduate enrollment.[51] On the other hand, Asians earned almost 3 percent of the S/E baccalaureates (9,007), 4 percent of the S/E master's degrees (2,130), almost 6 percent (806) of the S/E doctorates, and represented 2 percent of both total undergraduate and graduate enrollments in 1981. It may be interesting to note that of the Asians who earned doctorates from U.S. universities, 84 percent were not U.S. citizens. Native Americans in 1981 earned 0.4 percent (1,202) of the S/E bachelor's degrees, about 0.3 percent (159) of the S/E master's degrees, and slightly less than 0.2 percent (26) of the S/E doctorates. In comparison, they accounted for 0.7 percent of undergraduate enrollments and 0.4 percent of graduate enrollments. Since 1976, there has been virtually no change in the proportions of blacks and native Americans earning science and engineering degrees at all degree levels. Among Asians, their proportions have increased by about 1 percentage point within all degree levels.

Bachelor's Degrees—In 1981, blacks earning S/E bachelor's degrees were highly concentrated in the social sciences (43 percent) and psychology (18 percent). Comparatively, whites were concentrated in the social sciences (30 percent), engineering (22 percent), and the life sciences (20 percent).

Asians tended to earn their degrees in engineering and the life sciences. Over one-third of the S/E bachelor's degrees awarded to Asians in 1981 were in engineering fields, and another one-fifth were granted in the life sciences. Relatively few Asians (28 percent) compared with blacks (61 percent) earned their degrees in psychology and the social sciences.

Almost two-fifths of the bachelor's degrees awarded to native Americans were in the social sciences in 1981. Three fields accounted for one-half of the degrees awarded to native Americans: life sciences (19 percent), psychology (16 percent), and engineering (16 percent).

Advanced Degrees—Field differences also exist at advanced degree levels. About three-fifths of both the S/E master's and doctorates earned by blacks were in the social sciences and psychology. Among Asians in 1981, 51 percent of those receiving master's degrees earned them in engineering; at the doctoral level, the proportion was 35 percent. A significant fraction of Asians also earned advanced degrees in the life and physical sciences. In 1981, 159 S/E master's degrees and 26 S/E doctorates were awarded to native Americans. Degrees in the social sciences and psychology accounted for a substantial portion of the degrees awarded to native Americans at both levels. Comparatively, among whites at the master's level in 1981, 37 percent earned degrees in the social sciences and psychology, while another 23 percent earned degrees in engineering. At the doctoral level, 29 percent of the whites earned degrees in the life sciences and another 23 percent were granted degrees in psychology.

Graduate Support Status

The level and type of support received for graduate education can reflect disparities among racial groups. All racial groups cited universities most frequently as the primary source of support for 1982 science and engineering doctoral recipients, but to differing degrees (appendix table 76). Over one-half of the whites and Asians reported receiving university support, compared with about two-fifths and one-third, respectively, of the native Americans and blacks.[52] Other frequently reported sources of support were Federal and self. Blacks (24 percent) cited Federal support more often than any other racial group, while native Americans (31 percent) more often reported self support.

Of those receiving university support, with the exception of blacks, most reported holding research assistantships rather than teaching assistantships (table 3-7). While almost three-quarters of the native Americans, three-fifths of the Asians, and over half of the whites held research assistantships in 1982, only about one-third of the blacks held these positions. This lower propensity among blacks may partially reflect differing field distributions. For example, blacks were more highly concentrated in the fields of social science and psychology, where teaching assistantships are more often awarded. In 1982, over two-thirds of the blacks earned their degrees in these fields, compared with about one-half of the native Americans, one-third of the whites, and about one-fifth of the Asians.

Table 3-[illegible]. Proportion of doctorate recipients receiving graduate support from universities by type of support and race: 1982

(Percent)

Type of Support	White	Black	Asian	Native American
Universities, total	55	33	51	42
Fellowship	6	8	6	0
Teaching Assistantship	21	13	15	11
Research Assistantship	29	12	30	31

SOURCE: Based on Appendix table 76.

Postdoctoral Appointments

Between 1973 and 1981, minority representation among S/E postdoctorates rose from 10 percent to 16 percent. Although the number of blacks on postdoctoral appointments increased fourfold, from 31 to 120, blacks represented only about 1 percent of the S/E postdoctorates in 1981. In contrast, they received almost 2 percent of the doctorates awarded in science and engineering. The number of Asians on postdoctoral appointments also rose substantially between 1973 and 1981. The more than 1,500 Asians on these appointments in 1981 accounted for almost 15 percent of the total S/E postdoctorates, up from 9 percent. Among all S/E doctorates conferred, Asians represented 6 percent of the total. In 1981, 88 native Americans were on postdoctoral appointments, accounting for 0.8 percent of the total; they earned 0.2 percent of the S/E doctorates.

The field distribution of postdoctorates differs by racial group (appendix table 77). Almost 68 percent of the blacks held postdoctorates in the life sciences and another 13 percent held their appointments in the social sciences in 1981. Among Asians, although over one-half held postdoctorates in the life sciences, another two-fifths held them in the physical sciences. Native Americans reported holding postdoctorates in only two fields in 1981: life sciences (60 percent) and psychology (40 percent). In comparison, two-thirds of the whites held their appointments in the life sciences, and another one-fifth had postdoctorates in the physical sciences.

HISPANICS

Precollege Preparation

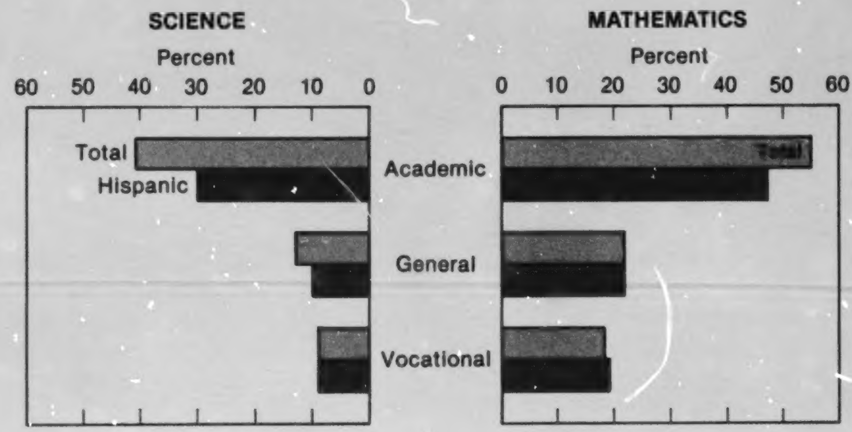
Curriculum and Coursework

Hispanics are much less likely than non-Hispanics to be enrolled in academic curriculums.[53] In 1980, 27 percent of the Hispanic high school seniors were on academic tracks, compared with 39 percent of all high school seniors. Hispanics who were enrolled in academic curriculums completed more mathematics and science courses in high school than did Hispanics in other curriculums (figure 3-12). However, they did not take as many mathematics and science courses as all high school seniors. About 47 percent of the Hispanic high school seniors enrolled in academic curriculums took three or more years of mathematics, whereas 55 percent of all 1980 high school seniors in academic programs did so. About 30 percent of the 1980 Hispanic seniors in academic curriculums had taken three or more years of science coursework, compared with 41 percent for all seniors.

Hispanic high school seniors take significantly more remedial mathematics coursework and somewhat less advanced (honors) mathematics coursework than all high school seniors.[54] In 1980, 38 percent of the Hispanic seniors, compared with 30 percent of all seniors, had taken remedial mathematics. In contrast, only 18 percent of the Hispanics and 23 percent of all high school seniors had taken advanced mathematics courses.

Although almost four-fifths of the 1980 high school seniors had taken algebra I, only two-thirds of the Hispanics had taken this course (appendix table 59). Hispanics were also less likely to take

Figure 3-12. Percentage of high school seniors taking three or more years of mathematics and science by curriculum and Hispanic status: 1980



SOURCE: Appendix table 57.

other mathematics and science courses. For example, although well over one-half of all seniors had taken geometry, slightly less than two-fifths of the Hispanics had taken it. Likewise among science courses, while the differential is not as wide between all seniors and Hispanic seniors who had taken physics (19 percent vs. 15 percent), it widens when considering the comparable proportions who had taken chemistry (37 percent vs. 26 percent).

Mathematics and Science Achievement

Results of the national assessment of mathematics reveal that Hispanics continue to score below the national average at all three age levels.[55] However, gains were made between the 1978 and 1982 assessments (appendix table 61). At age 9, the overall score for Hispanics was about 9 percentage points lower than the national average. Although this overall differential did not change between assessments, significant increases were made by Hispanics on the skills component. Scores for Hispanics on the knowledge, understanding, and applications components remained virtually unchanged.

The largest gains by Hispanics were made at the 13-year old level. In 1982, although 13-year old Hispanics scored 9 points lower than the national average, their scores increased almost 7 points since 1978. In comparison, overall scores rose about 4 points between assessments. Scores on all four components were up considerably, with the largest gain made on the skills component.

The smallest gains were made at the 17-year old level. In 1982, Hispanics scored 11 points below the national average. Between 1978 and 1982, overall scores for Hispanics remained virtually unchanged, although there were some variations across components. While scores for Hispanics on the skills, understanding, and applications components remained about the same, scores on the knowledge component increased.

Hispanics also scored lower than the national average on the science assessment at all three age levels in 1977.[56] Score differentials widened with age: at age 9 Hispanics scored about 8.5 points below the national average, while at age 17, the gap widened to almost 11 points. Regardless of age level, Hispanics scored much lower than the national average on the components of the assessment that measured understanding and applications of scientific processes.

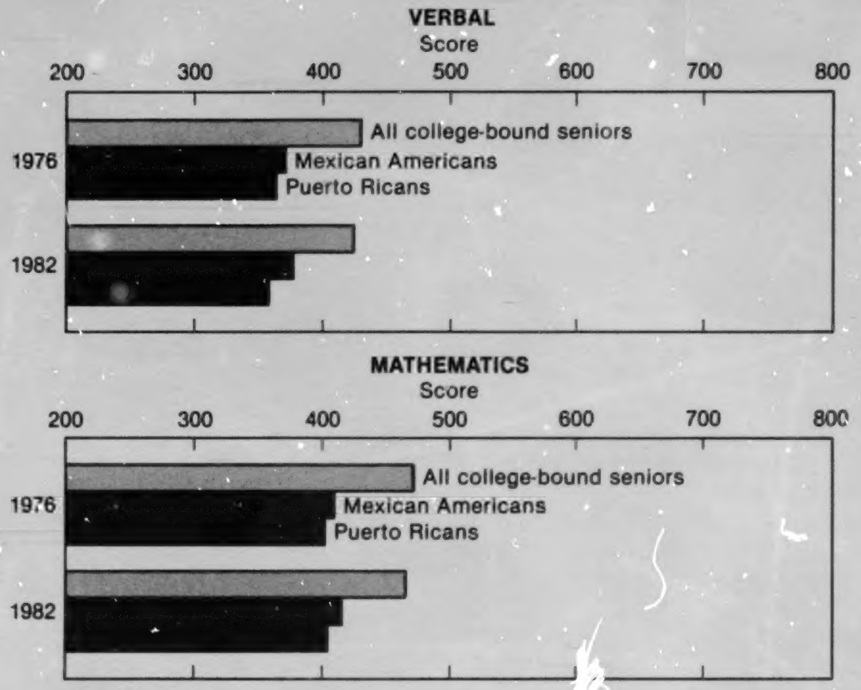
Characteristics of College-Bound Seniors

SAT—SAT scores for Hispanics are disaggregated between Mexican Americans and Puerto Ricans.[57] Scores for Mexican Americans rose on both components of the aptitude test between 1976 and 1982 (figure 3-13). However, Mexican Americans' SAT scores remained lower than scores for all college-bound seniors. In 1982, their verbal score (377) was 49 points below, and their mathematics score (416) was 51 points below, the comparable scores for all college-bound seniors. SAT scores for Puerto Ricans were consistently lower than those for Mexican Americans between 1976 and 1982. In 1982, they registered a verbal score of 360, down from 1976, and a mathematics score of 403, about the same as in 1976.

Very few Mexican Americans and Puerto Ricans score above 650 on the mathematics component of the SAT. In 1981, only 1 percent each of the Mexican Americans and Puerto Ricans scored at least 650 on this component.[58] Among all college-bound seniors, 4 percent scored above 650 on the mathematics section.

Achievement Test Scores—Similar to the case of blacks and native Americans, fewer Mexican Americans and Puerto Ricans take achievement tests in science and mathematics than take the SAT aptitude test. In 1981, of the college-bound seniors who took one or more of these tests, only 0.9 percent were Mexican American and 0.4 percent were Puerto Rican. For the same year, 1.7 percent of the college-bound

Figure 3-13. Scholastic Aptitude Test (SAT) scores by Hispanic status



SOURCE: Appendix table 64.

seniors reported their racial/ethnic background as Mexican American and another 0.8 percent reported being Puerto Rican.

Although their scores on the mathematics and science achievement tests were lower than overall scores, Puerto Ricans scored slightly higher than Mexican Americans on all five tests (table 3-8). In addition, with the exception of those seniors who took the biology and physics tests, Puerto Ricans had higher SAT mathematics scores than Mexican Americans (appendix table 65).

Intended Undergraduate Major—Mexican Americans are slightly more likely than, and Puerto Ricans about as likely as, all college-bound seniors to choose an S/E field as their intended undergraduate major. In 1981, about 38 percent of the Mexican Americans and 35 percent of the Puerto Ricans, compared with 36 percent of all college-bound seniors, intended to major in S/E.[59] Engineering was the most frequently chosen of the eight S/E fields: 37 percent of the Mexican Americans and 29 percent of the Puerto Ricans who intended to major in S/E chose this field of study. For all college-bound seniors, this proportion was 34 percent.

SAT mathematics scores for those Mexican Americans and Puerto Ricans intending to major in an S/E field were much lower than overall SAT mathematics scores. For example, of all seniors intending to major in engineering, Mexican Americans had SAT scores of 480, Puerto Ricans scored 464, and all college-bound seniors registered average SAT math scores of 541.

Precollege Summary

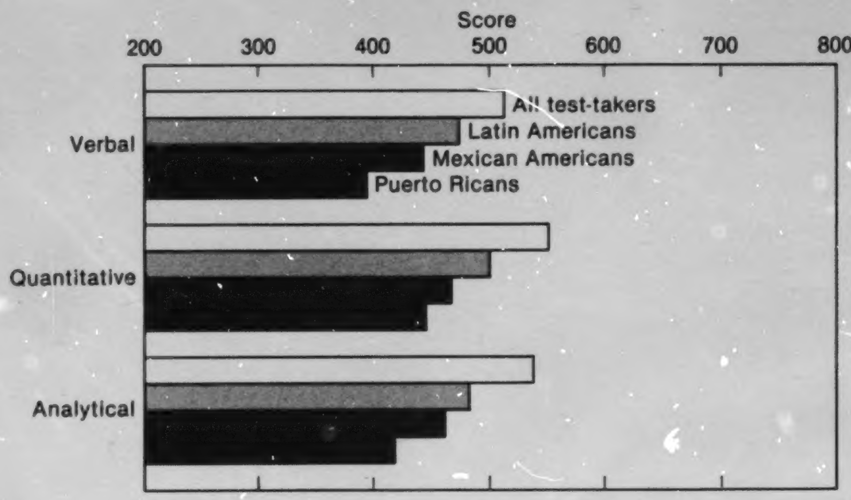
Participation patterns of Hispanics in math and science training at the precollege level are similar to those of black students. Hispanics are not enrolled in academic curriculums as often, nor do they take as many years of math and science coursework, as non-Hispanics. This lower participation is reflected in their scores on tests of math and science achievement. While Hispanics scored lower than the national average on the mathematics and science assessments at all age levels, the differential widened with age. Similarly, scores for Hispanics on the mathematics portion of the SAT were lower than the overall average, with Puerto Ricans registering scores slightly lower than Mexican Americans.

Table 3-8. Achievement test scores for total and by Hispanic status: 1981

Subject	Total	Mexican American	Puerto Rican
Mathematics level I	539	484	502
Mathematics level II	654	603	635
Chemistry	571	515	553
Biology	546	489	507
Physics	595	545	546

NOTE: Score range of achievement tests from 200 to 800.
SOURCE: Appendix table 65.

Figure 3-14. Graduate Rocord Examination (GRE) scores for test-takers who majored in S/E at the undergraduate level by Hispanic status: 1982



SOURCE: Appendix table 68.

Undergraduate Preparation

GRE scores for Hispanics are available only on a disaggregated basis. Of the GRE test-takers who were Hispanic and who majored in a science or engineering field at the undergraduate level, Latin Americans scored higher than Mexican Americans and Puerto Ricans on all three components of the aptitude test, with some variation by field in 1982 (figure 3-14 and appendix table 68). In addition, on all three components, Latin Americans scored less than 0.5 standard deviations below all GRE test-takers who majored in S/E.[60] Scores for Mexican Americans on all three components were less than 1 standard deviation lower than all test-takers, while scores for Puerto Ricans were generally 1 standard deviation or more lower than the total. In 1982, the highest score for all three ethnic groups was on the quantitative component—500 (Latin American), 466 (Mexican American), and 444 (Puerto Rican)—while the lowest score was registered on the verbal portion of the aptitude test—472 (Latin American), 441 (Mexican American), and 391 (Puerto Rican). Comparable scores for all GRE test-takers who majored in an S/E field were 551 and 512, respectively.

Of those who took the GRE in 1982, 1.3 percent were Mexican American, 0.9 percent were Puerto Rican, and another 0.9 percent were Latin American.[61] Among GRE test-takers who majored in S/E at the undergraduate level, 1.2 percent were Mexican American, 1.1 percent were Puerto Rican, and 1.0 percent were Latin American.

Earned Degrees

In 1981, Hispanics earned almost 8,000 bachelor's degrees in science and engineering and accounted for about 2.5 percent of all S/E baccalaureates awarded (up from 2.1 percent in 1976).[62] Comparatively, Hispanics accounted for over 4 percent of total undergraduate enrollment.[63] About 37 percent of the degrees granted to Hispanics were in the social sciences; almost 31 percent of all baccalaureate recipients earned social science degrees. Three fields accounted for another one-half of the degrees awarded to Hispanics: engineering, psychology, and the life sciences.

At the advanced degree level in 1981, Hispanics earned 2 percent of the S/E master's degrees awarded (unchanged from 1976) and about 1.6 percent of all S/E doctorates granted (up from 0.8 percent in 1976). At the master's degree level, engineering and social science degrees accounted for over half of the degrees awarded to Hispanics in 1981. Among S/E doctorates awarded to Hispanics, degrees in psychology and the life and social sciences represented three-quarters of the total number awarded. Overall, Hispanics represented 1.8 percent of graduate enrollments in S/E. Hispanics held 1.2 percent of the S/E postdoctoral appointments.

Graduate Support Status

Of those who earned their doctorates in science and engineering in 1982, Hispanics did not report universities as their primary source of support as often as all new degree holders, two-fifths vs. over one-half.[64] Of those receiving university support, Hispanics were less likely than the total to hold research assistantships (two-fifths vs. one-half) or teaching assistantships (one-third vs. two-fifths). Other sources of support cited by Hispanics were Federal (one-fifth) and self (one-fifth) (appendix table 76).

This distribution has changed somewhat over time. The most dramatic shift has been in the proportion reporting university support, up almost 7 percentage points from 33 percent in 1978. Underlying this shift were increases in the number of Hispanics holding fellowships, up 9 points, and teaching assistantships, up 4 points. This increase in university support was undercut somewhat by a drop in the proportion of Hispanics holding research assistantships. In comparison, the distribution for all those who earned their doctorates remained virtually constant between 1972 and 1982.

ENDNOTES

1. National Assessment of Educational Progress, *Science Achievement in the Schools*, (Report No. 08-S-01), (Denver, Colorado: National Institute of Education, 1978), p. 19.

2. U.S. Department of Education, National Center for Education Statistics, *High School and Beyond: A National Longitudinal Study for the 1980's*, (Washington, D.C., 1981), p. 3.

3. U.S. Department of Education, National Center for Education Statistics, *Projections of Education Statistics to 1990-91*, Vol. I, (Washington, D.C., 1982), p. 4.

4. All coursework by curriculum data for 1980 high school seniors are from National Center for Education Statistics, unpublished data.

5. U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, 1982*, (Washington, D.C., 1982), p. 78.

6. Those seniors taking the Scholastic Aptitude Test (SAT) and who answer the Student Descriptive Questionnaire (SDQ); about one-third of all high school seniors take this exam each year.

7. Admissions Testing Program of the College Board, *Profiles, College-Bound Seniors, 1981*, (New York: College Entrance Examination Board, 1982), p. 5.

8. Admissions Testing Program of the College Board, *National College-Bound Seniors, 1981*, (New York: College Entrance Examination Board, 1981), p. 14.

9. *High School and Beyond*, p. 5.

10. Ibid.

11. Other areas include art, career and occupational development, citizenship, literature, music, social studies, reading, and writing.

12. Mathematical assessment data by sex for 1978 and 1982 are from National Assessment of Educational Progress, *The Third National Mathematics Assessment: Results, Trends, and Issues*, (Report No. 13-MA-01), April 1983, pp. 37-40.

13. Science assessment data by sex for 1976-77 and 1981-82 are from Science Assessment and Research Project, University of Minnesota, *Images of Science*, (Minneapolis, Mn.: Minnesota) Research and Evaluation Center, June 1983, pp. 101-119.

14. *Profiles, 1981*, p. v.

15. Admissions Testing Program of the College Board, *National College-Bound Seniors, 1982*, (New York: College Entrance Examination Board, 1982), p. 5.

16. *Profiles, 1981*, pp. 8 and 18.

17. Admissions Testing Program of the College Board, unpublished data.

18. Of the 15 academic subjects for which achievement tests were given in 1981, five are in science or mathematics: Chemistry, Biology, Physics, Mathematics Level I, and Mathematics Level II.

19. Overall population numbers for achievement test-takers must be considered synthetic counts because students taking more than one test are tabulated independently for each test.

20. *Profiles, 1981*, pp. 11 and 21.

21. For purposes of this analysis, science and engineering fields include physical science, mathematical science, engineering, biological science, behavioral science, and social science. See Marlene B. Goodison, *A Summary of Data Collected From Graduate Record Examinations Test-Takers During 1981-82, Data Summary Report #7*, (Princeton: Educational Testing Service, 1983), p. 68, for an example of field classifications.

22. The number of GRE test-takers and GRE test scores can be found in Goodison, *Data Summary Report #7*, pp. 68-70.

23. The standard deviation, the extent of score diversion around the mean, falls between approximately 100 and 150 points for both men and women and for all disciplines. Goodison, *Data Summary Report #7*, pp. 68-70.

24. Total enrollment for 1981 is projected datum. See *Projections, 1990-91*, Vol. I, p. 118.

25. For a more detailed explanation of these indices, see Committee on the Education and Employment of Women in Science and Engineering, National Research Council, *Climbing the Ladder, An Update on the Status of Doctoral Women Scientists and Engineers*, (Washington, D.C.: National Academy Press, 1983), pp. 1.11-12.

26. National Research Council, unpublished data.

27. Committee on the Education and Employment of Women in Science and Engineering, *Climbing the Ladder*, see chapter 3.

28. Ibid., p. 3.4.

29. National Research Council, *Postdoctoral Appointments and Disappointments*, (Washington, D.C.: National Academy Press, 1981), p. 151.

30. Unless otherwise specified, all curriculum and coursework data for 1980 high school seniors by race are from National Center for Education Statistics, unpublished data.

31. It should be noted that students in general or vocational curriculums may not take the same types of mathematics courses as seniors in academic curriculums. For instance, students in general curriculums would probably take a general

or business mathematics course rather than geometry.

32. *Condition of Education, 1982*, p. 78.

33. *Profiles, 1981*, pp. 28, 37, 56, and 75.

34. *High School and Beyond*, p. 5.

35. Due to insufficient sample size, NAEP does not include data on racial/ethnic groups other than whites, blacks, and Hispanics. In 1982, with little variation between age groups, about 80 percent of the sample was white, approximately 13 percent was black, another 5 percent was classified as Hispanic, and the remaining 2 percent was identified as "other minorities." See *The Third National Mathematics Assessment: Results, Trends, and Issues*, p. 33.

36. For detailed results, see *The Third National Mathematics Assessment: Results, Trends, and Issues*, Appendix Table D.

37. For a more complete treatment of the differences in achievement between whites and blacks, see Lyle V. Jones, "White-Black Achievement Differences: The Narrowing Gap," prepared as an Invited Address, American Psychological Association Annual Convention, Anaheim, California, 29 August 1983.

38. Science assessment data from *Images of Science*, pp. 101-119.

39. Lawrence Biemiller, "Board Says Minority-Group Scores Helped Push Up Averages on SAT," *Chronicle of Higher Education*, Vol. XXV, No. 8, 20 October 1982, pp. 1 and 10.

40. *Profiles*, 1981, pp. 32, 41, 60, and 79.

41. Ibid., based on data from pp. 100-101.

42. "Ethnic background" classifications include seven categories: white, black, American Indian (native American), Asian/Pacific American (Oriental), Mexican American, Puerto Rican, and other. See, for example, *National College-Bound Seniors, 1982*, p. 15.

43. *Profiles, 1981*, p. 1.

44. Among the fields listed as intended undergraduate majors, Agriculture, Biological sciences, Physical sciences and related areas, Psychology and Social sciences are classified as S/E fields for purposes of this report. For an example of the field listing, see *National College-Bound Seniors, 1982*, p. 18.

45. *Profiles, 1981*, pp. 31, 40, 59, and 78.

46. Ibid.

47. All GRE test score data from Goodison, *Data Summary Report #7*, pp. 76-78.

48. "Ethnic group" classifications include white, black/Afro-American, Asian American, American Indian (native American), Mexican American, Puerto Rican, Latin American, and other. See Goodison, *Data Summary Report #7*, p. 74.

49. Ibid., based on data from p. 76.

50. In 1982, overall standard deviations were 115 on the verbal component, 130 on the quantitative component, and 123 on the analytical component.

51. *Condition of Education, 1982*, p. 134.

52. National Research Council, unpublished data.

53. Unless otherwise noted, curriculum and coursework data for Hispanics are from National Center for Education Statistics, unpublished data.

54. *Condition of Education, 1982*, p. 78.

55. *The Third National Mathematics Assessment: Results, Trends, and Issues*, Appendix Table D.

56. The latest science assessment data for Hispanics are for 1977. National Assessment for Educational Progress, unpublished data.

57. Biemiller, *Chronicle of Higher Education*.

58. *Profiles, 1981*, pp. 51, 70, and 99.

59. Ibid., pp. 50, 69, and 93.

60. Based on data from Goodison, *Data Summary Report #7*, pp. 76-78.

61. Ibid., p. 74.

62. Excludes Puerto Ricans.

63. *Condition of Education, 1982*, p. 134.

64. All Graduate Support Status data from National Research Council, unpublished data.

Technical Notes

CONCEPTS AND DEFINITIONS

The National Science Foundation (NSF) publishes estimates on the number, type of employer, work activity, and other economic and demographic characteristics of persons who meet its particular definition of a scientist or engineer. Broadly speaking, a person is considered a scientist or engineer if at least two of the following criteria are met:

1. Highest degree in science (including social science) or engineering;
2. Employed in a science or engineering occupation; and/or
3. Professional identification as a scientist or engineer based on total education and work experience.

Composite Estimates

The composite estimates, representing national totals, are developed as a part of the National Science Foundation's Scientific and Technical Personnel Data System (STPDS). During the past two years, NSF has been in the process of revising the STPDS in two ways: (a) the completion of the 1980 decennial census provided a mechanism to redraw a sample of scientists and engineers (see *The Postcensal Survey of Scientists and Engineers* below); and (b) the basis on which total estimates are created was updated to reflect state-of-the-art methodologies. The estimates in this report, although preliminary, reflect the first published version of this revised system. As in the past, the system consists of three subsystems, each designed to measure the characteristics of a particular subpopulation:

- *The Postcensal Survey of Scientists and Engineers* consists of almost 150,000 cases drawn from those individuals who were in the labor force or the labor reserve at the time of the 1980 decennial census. The Postcensal Survey (as well as the follow-up surveys of Experienced Scientists and Engineers) was conducted for the National Science Foundation by the Bureau of Census.
- *The New Entrants Survey* is designed to measure the magnitude and characteristics of those who earned degrees in science and engineering after the 1980 decennial census was completed. Samples of the graduating classes of 1980 and 1981 were surveyed by the Institute for Survey Research, Temple University, Philadelphia, Pennsylvania.
- *The Roster of Doctoral Scientists and Engineers*, maintained by the Commission on Human Resources, National Research Council, National Academy of Sciences, consists of all known doctoral scientists and engineers in the United States since 1930. The roster serves as a panel from which a sample of 60,000 scientists and engineers covering the years 1938-80 were selected to provide data on the doctoral population of the Nation.

Occupation/Field of Science or Engineering

Data on field of science or engineering are derived from responses to questions on various surveys. Fields are classified as follows:

- *Physical sciences*—chemistry, physics, astronomy, and other physical sciences including metallurgy
- *Mathematical sciences*—mathematics and statistics
- *Environmental sciences*—earth, atmospheric, and oceanographic sciences, including geophysics, geology, seismology, and meterology
- *Life sciences*—agricultural, biological, and medical sciences (excluding those primarily engaged in patient care)
- *Social sciences*—economics, including agricultural economics, sociology, anthropology, and all other social sciences
- *Psychology*
- *Computer specialties*
- *Engineering*

Data on field of employment are derived from responses to questions that request—based on Employment Specialties lists included with the questionnaire—the name of the specialty most closely related to the respondent's principal employment. Those who selected an employment specialty not in science or engineering are assigned to a field of science or engineering based on the field of their degree and for those with less than a doctorate, their professional self-identification.

Primary Work Activity

Data presented on the work activities of scientists and engineers represent their *primary* work activities. The data are derived from responses to a series of questions on the survey instruments that ask individuals: (1) to specify their primary work activity, and (2) to provide a percentage distribution of their work time among 10 to 15 listed activities.

Other Variables

Information on other economic and demographic variables, such as type of employer, sex, race, and ethnic group, are based on individual responses to survey questions. For information on the various survey instruments used in the report, see the section entitled *Data Sources* below.

Statistical Measures

Labor Force Participation Rates—The labor force is defined as those employed and those seeking employment. The labor force participation rate (LFPR) is the ratio of those employed (E) and those unemployed but seeking employment (U) to the population (P).

$$\text{LFPR} = \frac{E + U}{P}$$

S/E Employment Rates—The S/E employment rate (ES/E) measures the ratio of those holding jobs in science or engineering (S/E) to the total employment (E) of scientists and engineers, which includes those holding nonscience and nonengineering jobs.

$$\text{ES/E} = \frac{S/E}{E}$$

Unemployment Rates—The unemployment rate (UE/R) shows the ratio of those who are unemployed but seeking employment (U) to the total labor force (LF = E + U).

$$\text{UE/R} = \frac{U}{E + U}$$

S/E Underemployment Rates—The S/E underemployment rate (UDE) shows the ratio of those who are working part-time but seeking full-time jobs (PTS) or who are working in a non-S/E job when an S/E job would be preferred (NS/E) to total employment (E).

$$\text{UDE} = \frac{PTS + NS/E}{E}$$

S/E Underutilization Rates—The S/E underutilization rate (UDU) shows the proportion of those in the total labor force (LF = E + U) who are either unemployed but seeking employment (U), working part-time but seeking full-time jobs (PTS), or working involuntarily in a non-S/E job (NS/E).

$$\text{UDE} = \frac{U + PTS + NS/E}{E + U}$$

Data Sources

The Division of Science Resources Studies is just finishing the process of reconstituting its Scientific and Technical Personnel Data System (STPDS). As such, publications detailing methods and definitions for the national estimates of scientists and engineers used in this report are not yet available. For additional information, please contact the Scientific and Technical Personnel Studies Section, Division of Science Resources Studies, Room L-611, National Science Foundation, Washington, D.C. 20550.

For a brief description of major surveys and copies of the survey instruments, see *A Guide to NSF Science Resources Data*, available from the Editorial and Inquiries Unit, Division of Science Resources Studies, (Room L-611, National Science Foundation, Washington, D.C. 20550.

Reliability of Scientist and Engineer Estimates

Since the data on scientists and engineers are derived from sample surveys, the estimates are subject to both sampling and nonsampling errors.

The sample used for a particular survey is only a large number of possible samples of the same size that could have been selected using the same sample design. Even if the same questionnaire and instructions were used, the estimate from each of the samples would differ from each other. The deviation of a sample estimate from the average of all possible samples is defined as sampling error. The standard error of a survey estimate attempts to provide a measure of this variation and thus is a measure of the precision with which an estimate from the sample approximates the average results of all possible samples.

Selected tables of standard errors for the various surveys are contained on the following pages as listed below.

Survey	*Table*
1982 Composite estimates of total scientists and engineers	1
1981 Doctoral scientists and engineers	2
1982 Recent S/E graduates	3,4

The sampling errors shown were generated on the basis of approximations and must, therefore, be considered estimates rather than precise measurements. The standard error may be used to construct a confidence interval about a given estimate. Thus, when the reported standard error is added to and subtracted from an estimate, the resulting range of values reflects an interval within which about 68 percent of all sample estimates, surveyed under the same conditions, will fall. Intervals reflecting a higher confidence level may be constructed by increasing the number of standard errors for a given estimate. Thus, ±1.6 standard errors defines a 90 percent confidence interval; ±2 standard errors, a 95 percent confidence interval.

Nonsampling errors can be attributed to many sources: inability to obtain information about all cases, definitional difficulties, differences in the interpretation of questions, inability or unwillingness to provide correct information on the part of the respondents, mistakes in recording or coding the information, and other errors in collection, response, processing, coverage, and imputation. Nonsampling errors are not unique to sample surveys since they can, and do, occur in complete canvasses as well. No systematic attempt has been made to identify or approximate the magnitude of the nonsampling errors associated with the estimates of scientists and engineers presented in this report.

Table 1. Standard errors for estimates of total scientists and engineers: 1982

Size of estimate	Total all fields	Physical scientists	Mathematical scientists	Computer specialists	Environmental scientists	Engineers	Life scientists	Psychologists	Social scientists
100	75	80	60	80	60	70	80	90	80
200	100	120	90	120	80	100	120	130	120
500	170	190	150	200	130	160	180	200	190
700	200	230	170	230	160	190	220	240	220
1,000	240	270	210	280	190	230	260	280	260
2,500	380	430	320	430	290	360	400	450	420
5,000	540	610	450	620	410	510	570	630	590
10,000	770	850	600	870	570	720	880	880	810
25,000	1,200	1,300	740	1,300	810	1,100	1,200	1,300	1,200
50,000	1,700	1,700		1,800	920	1,600	1,700	1,600	1,700
75,000	2,100	2,000		2,200	740	1,900	2,000	1,800	2,000
80,000	2,200	2,000		2,200	650	2,000	2,100	1,700	2,000
100,000	2,400	2,100		2,400		2,200	2,200	1,400	2,100
125,000	2,700	2,200		2,600		2,500	2,300		2,200
150,000	2,900	2,100		2,700		2,700	2,400		2,200
175,000	3,100	1,900		2,700		2,900	2,500		2,200
200,000	3,300	1,700		2,800		3,000	2,500		2,000
225,000	3,500	1,200		2,700		3,200	2,500		1,800
250,000	3,700	2,700				3,400	2,400		1,400
275,000	3,900					3,500	2,200		
300,000	4,000					3,600	2,000		
400,000	4,600					4,100			
500,000	5,000					4,400			
600,000	5,400					4,600			
700,000	5,800					4,800			
800,000	6,100					5,000			
900,000	6,300					5,100			
1,000,000	6,500					5,100			
1,200,000	6,900					5,000			
1,300,000	7,000					4,800			
1,500,000	7,200					4,400			
2,000,000	7,200								
2,500,000	6,700								
3,000,000	5,400								
3,500,000	2,300								

Source: Mathematica Policy Research, Inc.

Table 2. Standard errors for doctoral scientists and engineers: 1981

Total population

Size of estimate	Estimated sampling error	Base of percent	Estimated percent					
			1/99	2/98	5/95	10/90	25/75	50
100	35	500	1.55	2.19	3.40	4.69	6.76	7.81
200	49	1,000	1.10	1.55	2.41	3.31	4.78	5.52
500	78	2,000	.78	1.09	1.70	2.34	3.38	3.90
1,000	110	5,000	.49	.69	1.08	1.48	2.14	2.47
2,000	156	10,000	.35	.49	.76	1.05	1.51	1.75
5,000	245	15,000	.28	.40	.62	.86	1.23	1.43
10,000	344	20,000	.25	.35	.54	.74	1.07	1.23
15,000	419	30,000	.20	.28	.44	.60	.87	1.01
20,000	480	40,000	.17	.24	.38	.52	.76	.87
30,000	579	50,000	.16	.22	.34	.47	.68	.78
40,000	658	75,000	.13	.18	.28	.38	.55	.64
50,000	725	100,000	.11	.15	.24	.33	.48	.55
75,000	852	150,000	.09	.13	.20	.27	.39	.45
100,000	940	200,000	.08	.11	.17	.23	.34	.39
150,000	1,037	250,000	.07	.10	.15	.21	.30	.35
200,000	1,048	275,000	.07	.09	.15	.20	.29	.33
250,000	977	300,000	.06	.09	.14	.19	.28	.32
300,000	801	325,000	.05	.09	.13	.18	.27	.31

Employed women

Size of estimate	Estimated sampling error	Base of percent	Estimated percent					
			1/99	2/98	5/95	10/90	25/75	50
100	20	500	.96	1.36	2.11	2.91	4.19	4.84
200	29	1,000	.68	.96	1.49	2.05	3.97	3.42
500	45	2,000	.48	.68	1.06	1.45	2.10	2.42
1,000	64	5,000	.30	.43	.67	.92	1.33	1.53
2,000	89	10,000	.22	.30	.47	.65	.94	1.08
5,000	135	15,000	.18	.25	.39	.53	.77	.88
10,000	177	20,000	.15	.21	.33	.46	.66	.77
15,000	199	25,000	.14	.19	.30	.41	.59	.68
20,000	206	30,000	.12	.18	.27	.38	.54	.63
30,000	183							

Employed by field

Field	Size of estimate													
	100	200	500	1,000	2,000	5,000	10,000	15,000	20,000	30,000	40,000	50,000	60,000	70,000
Physical scientists	35	55	85	115	165	255	340	400	435	470	450	380		
Mathematical scientists	30	40	65	90	125	175	180							
Computer specialists	30	45	70	95	125	150								
Environmental scientists	30	40	65	90	125	175	185							
Engineers	50	65	105	150	210	320	430	500	540	565	520	370		
Life scientists	30	40	65	95	130	205	280	335	370	420	440	435	405	350
Psychologists	35	50	80	115	160	240	315	360	375	345				
Social scientists	40	60	90	130	180	280	375	430	465	475	410			

Source: National Science Foundation.

Table 3. Generalized standard errors for combined 1980 and 1981 S/E bachelor's degree recipients: 1982

Size of estimate	Total all fields	Physical scientists	Mathematical scientists	Computer specialists	Environmental scientists	Engineers	Life scientists	Psychologists	Social scientists
100	160	90	95	80	85	100	140	130	190
200	230	130	130	120	120	140	190	180	270
300	280	160	160	140	150	170	230	230	330
400	320	180	190	160	170	200	270	260	380
500	360	200	210	180	190	220	300	290	430
750	440	250	260	220	230	270	370	360	520
1,000	510	280	290	250	260	310	430	410	600
2,000	720	390	400	350	350	440	600	570	840
3,000	890	460	480	420	400	540	730	700	1,050
4,000	[illegible]000	510	540	470	430	620	840	800	1,200
5,000	1,150	550	580	520	430	690	930	880	1,300
6,000	1,250	580	620	550	420	750	1,000	960	1,450
7,000	1,350	600	650	580	390	810	1,100	1,000	1,550
8,000	1,450	600	670	600	340	860	1,150	1,100	1,650
9,000	1,500	620	680	620	240	910	1,200	1,150	1,750
10,000	1,600	620	680		630	950	1,250	1,200	1,800
15,000	1,950	480	610		630	1,150	1,500	1,350	2,200
20,000	2,250			510		1,300	1,650	1,500	2,450
30,000	2,700					1,500	1,850	1,550	2,850
40,000	3,100					1,600	1,950	1,400	4,000
50,000	3,400					1,700	1,900	1,000	3,250
60,000	3,700					1,700	1,700		3,250
70,000	3,950					1,650	1,350		3,200
80,000	4,150					1,550			3,050
90,000	4,350					1,400			2,800
100,000	4,500					1,150			2,350
200,000	5,400								
300,000	5,050								
400,000	3,250								

Source: Institute for Survey Research, Temple University and National Science Foundation.

Table 4. Generalized standard errors for combined 1980 and 1981 S/E master's degree recipients: 1982

Size of estimate	Total all fields	Physical scientists	Mathematical scientists	Computer specialists	Environmental scientists	Engineers	Life scientists	Psychologists	Social scientists
100	90	60	90	75	40	65	75	95	110
200	130	80	130	100	55	95	110	130	150
300	150	100	150	130	65	110	130	160	190
400	180	110	180	150	75	130	150	190	210
500	200	120	190	160	80	150	170	210	240
750	240	150	230	190	90	180	200	250	290
1,000	280	160	260	220	100	200	230	280	330
1,500	340	180	300	260	100	250	280	320	390
2,000	390	190	330	290	80	280	310	350	440
3,000	480	160	350	320		340	370	370	510
4,000	550		320	330		380	400	340	550
5,000	610			320		410	410	250	570
6,000	660			280		440	420		570
7,000	710					460	410		550
8,000	750					470	390		510
9,000	790					480	360		440
10,000	820					490	300		
15,000	970					460			
20,000	1,050					300			
30,000	1,150								
40,000	1,200								
50,000	1,100								
60,000	860								

Source: Institute for Survey Research, Temple University and National Science Foundation.

Appendix Tables

Number Page

1 Scientists and engineers by field, sex, and selected employment status: 1982 55

2 Scientists and engineers by field, race, and selected employment status: 1982 56

3 Women scientists and engineers by field, race, and selected employment status: 1982 59

4 Hispanic scientists and engineers by field, sex, and selected employment status: 1982 62

5 Doctoral scientists and engineers by field, sex, and selected employment status: 1973, 1979, and 1981 63

6 Doctoral scientists and engineers by field, race, and selected employment status: 1973, 1979, and 1981 64

7 Women doctoral scientists and engineers by field, race, and selected employment status: 1973, 1979, and 1981 66

8 Doctoral scientists and engineers by field, sex, and selected employment status: 1981 68

9 Doctoral scientists and engineers by field, race, and selected employment status: 1981 69

10 Women doctoral scientists and engineers by field, race, and selected employment status: 1981 71

11 Hispanic doctoral scientists and engineers by field, sex, and selected employment status: 1981 73

12 Selected characteristics of physically-handicapped scientists and engineers: 1982 74

13 Selected characteristics of physically-handicapped doctoral scientists and engineers: 1981 75

14 Scientists and engineers by field, sex, and primary work activity: 1982 76

15 Scientists and engineers by field, race, and primary work activity: 1982 77

16 Women scientists and engineers by field, race, and primary work activity: 1982 79

17 Hispanic scientists and engineers by field, sex, and primary work activity: 1982 81

Number Page

18 Doctoral scientists and engineers by field, sex, and primary work activity: 1981 82

19 Doctoral scientists and engineers by field, race, and primary work activity: 1981 83

20 Women doctoral scientists and engineers by field, race, and primary work activity: 1981 85

21 Hispanic doctoral scientists and engineers by field, sex, and primary work activity: 1981 87

22 Scientists and engineers by field, sex, and type of employer: 1982 88

23 Scientists and engineers by field, race, and type of employer: 1982 89

24 Women scientists and engineers by field, race, and type of employer: 1982 91

25 Hispanic scientists and engineers by field, sex, and type of employer: 1982 93

26 Doctoral scientists and engineers by field, sex, and type of employer: 1981 94

27 Doctoral scientists and engineers by field, race, and type of employer: 1981 95

28 Women doctoral scientists and engineers by field, race, and type of employer: 1981 97

29 Hispanic doctoral scientists and engineers by field, sex, and type of employer: 1981 99

30 Scientists and engineers, by field, race, sex, and full-time/part-time status: 1982 100

31 Doctoral scientists and engineers by field, race, sex, and full-time/part-time status: 1981 102

32 Employed scientists and engineers by field, sex, and years of professional experience: 1982 104

33 Employed scientists and engineers by field, race, and years of professional experience: 1982 105

34 Employed women scientists and engineers by field, race, and years of professional experience: 1982 107

35 Employed Hispanic scientists and engineers by field, sex, and years of professional experience: 1982 109

Number Page

36 Employed doctoral scientists and engineers by field, sex, and years of professional experience: 1981 110

37 Employed doctoral scientists and engineers by field, race, and years of professional experience: 1981 111

38 Employed women doctoral scientists and engineers by field, race, and years of professional experience: 1981 113

39 Employed Hispanic doctoral scientists and engineers by field, sex, and years of professional experience: 1981 115

40 Reason for non-S/E employment of women and minorities 116

41 Recent science and engineering bachelor's degree recipients by field of degree, sex, and labor force/employment status: 1982 117

42 Recent science and engineering master's degree recipients by field of degree, sex, and labor force/employment status: 1982 118

43 Recent science and engineering bachelor's degree recipients by field of degree, race, and labor force/employment status: 1982 119

44 Recent science and engineering master's degree recipients by field of degree, race, and labor force/employment status: 1982 121

45 Selected employment characteristics of scientists and engineers by field, racial/ethnic group and sex: 1982 123

46 Selected employment characteristics of doctoral scientists and engineers by field, racial/ethnic group and sex: 1981 127

47 Selected employment characteristics of recent S/E bachelor's degree recipients by field of degree, racial/ethnic group, and sex: 1982 131

48 Selected employment characteristics of recent S/E master's degree recipients by field of degree, racial/ethnic group and sex: 1982 135

49 Average annual salaries of scientists and engineers by field, racial/ethnic group, and years of professional experience: 1982 139

Number		Page
50	Average annual salaries of men scientists and engineers by field, racial/ethnic group, and years of professional experience: 1982	141
51	Average annual salaries of women scientists and engineers by field, racial/ethnic group, and years of professional experience: 1982	143
52	Average annual salaries of doctoral scientists and engineers by field, racial/ethnic group, and years of professional experience: 1981	145
53	Average annual salaries of men doctoral scientists and engineers by field, racial/ethnic group, and years of professional experience: 1981	147
54	Average annual salaries of women doctoral scientists and engineers by field, racial/ethnic group, and years of professional experience: 1981	149
55	Average annual salaries of recent S/E degree recipients by field of degree, degree level, and sex/race/ethnic group: 1982	151
56	High school seniors by sex/racial/ethnic group and curriculum: 1980	152
57	High school seniors taking three or more years of mathematics and science by sex/racial/ethnic group and curriculum: 1980	153
58	Mathematics and science courses of high school seniors by sex and course title: 1980	154
59	Mathematics and science courses of high school seniors by racial/ethnic group and course title: 1980	155
60	Changes in mean performance on the Mathematics Assessment by sex: 1978-1982	156
61	Changes in mean performance on the Mathematics Assessment by racial/ethnic group: 1978-1982	157
62a	Changes in mean performance on the Science Assessment by sex: 1977-82	158
62b	Changes in mean performance for males and females on the Science Assessment by race: 1977-82	159
63	Scholastic Aptitude Test (SAT) scores for college-bound seniors by sex: 1970-83	160
64	Scholastic Aptitude Test (SAT) scores for college-bound seniors by race/ethnic group: 1976-82	161
65	Scores for college-bound seniors on achievement tests in mathematics and science by sex and racial/ethnic group: 1981	162
66	Intended area of study of college-bound seniors by sex and racial/ethnic group: 1981	163
67	Graduate Record Examination (GRE) scores by sex/race and undergraduate major: 1978/79 and 1981/82	164
68	Graduate Record Examination (GRE) scores of Hispanics by undergraduate major and Hispanic origin: 1981/82	166
69	Science and engineering bachelor's/first professional degree recipients by field and sex: 1970-81	167
70	Science and engineering master's degree recipients by field and sex: 1970-81	169
71	Science and engineering doctorate recipients by field and sex: 1970-82	171
72	Graduate degree attainment rates by sex: 1972-81	173
73	Parity indices for women earning doctoral degrees in science and engineering fields: 1970 and 1982	174
74	Science and engineering degree recipients by field, racial/ethnic group, and degree level: 1980/81	175
75	Major sources of graduate support of 1982 S/E doctorate recipients by field and sex	178
76	Major sources of graduate support of 1982 S/E doctorate recipients by racial/ethnic group	180
77	Postdoctorates in science and engineering by field and sex/race: 1973, 1979, and 1981	181

Appendix table 1 - Scientists and engineers by field, sex, and selected employment status: 1982

Field	Total population			Total employed			S/E employed		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	3,588,000	3,098,800	489,700	3,328,500	2,891,300	437,100	2,901,800	2,551,000	350,800
Total scientists	1,608,000	1,190,200	417,800	1,488,900	1,116,200	372,700	1,196,100	905,400	290,700
Physical scientists	248,700	218,000	30,700	225,100	198,800	26,300	206,700	182,500	24,200
Chemists	171,600	146,200	25,400	154,200	132,600	21,700	140,900	121,000	19,900
Physicists/astronomers	49,700	46,800	2,900	45,800	43,200	2,500	42,900	40,600	2,300
Other physical scientists	27,400	25,000	2,400	25,100	22,900	2,100	22,900	20,900	1,900
Mathematical scientists	49,200	26,300	22,900	44,600	24,200	20,400	40,400	22,300	18,100
Mathematicians	32,100	19,100	13,000	29,100	17,500	11,600	26,500	16,200	10,300
Statisticians	17,100	7,300	9,900	15,500	6,700	8,800	13,900	6,100	7,800
Computer specialists	395,800	284,200	111,600	382,200	278,100	104,100	272,300	197,300	75,000
Environmental scientists	93,900	81,800	12,100	85,700	75,400	10,400	80,700	71,000	9,700
Earth scientists	79,000	68,300	10,700	72,400	63,200	9,200	68,200	59,600	8,600
Oceanographers	3,900	3,300	600	3,300	2,900	400	2,900	2,600	400
Atmospheric scientists	11,000	10,200	900	10,000	9,200	800	9,600	8,900	700
Life scientists	380,200	292,300	87,900	350,900	273,600	77,300	308,600	241,800	66,800
Biological scientists	268,200	201,500	66,700	246,400	188,400	58,000	219,500	169,100	50,500
Agricultural scientists	82,200	68,100	14,100	75,700	63,100	12,500	64,000	53,100	10,900
Medical scientists	29,800	22,700	7,100	28,900	22,100	6,800	25,100	19,700	5,400
Psychologists	156,000	90,800	65,200	144,200	85,300	59,000	108,600	66,800	41,700
Social scientists	284,100	196,800	87,300	256,000	180,800	75,200	178,800	123,700	55,100
Economists	123,200	99,000	24,200	112,100	91,100	20,900	81,100	64,400	16,700
Sociologists/ anthropologists	67,300	36,700	30,600	61,000	34,000	27,000	40,300	23,100	17,200
Other social scientists	93,600	61,100	32,500	82,900	55,700	27,200	57,400	36,200	21,200
Engineers	1,980,500	1,908,600	71,900	1,839,600	1,775,100	64,500	1,705,700	1,645,600	60,100

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 2 - Scientists and engineers by field, race, and selected employment status: 1982

Field	*Total*[1]	*White*	*Black*	*Asian*	*Native American*
	Total population				
Total S/E	3,588,500	3,278,200	92,800	160,900	14,200
Total scientists	1,608,000	1,472,400	49,700	59,800	6,000
Physical scientists	248,700	228,400	6,500	10,400	600
Chemists	171,600	155,500	5,800	8,400	500
Physicists/astronomers	49,700	46,800	500	1,400	100
Other physical scientists	27,400	26,100	200	600	(2)
Mathematical scientists	49,200	37,400	3,000	7,600	(2)
Mathematicians	32,100	25,100	1,900	4,200	(2)
Statisticians	17,100	12,400	1,100	3,500	(2)
Computer specialists	395,800	366,100	9,700	14,700	1,200
Environmental scientists	93,900	87,400	600	3,800	700
Earth scientists	79,000	73,900	500	2,900	500
Oceanographers	3,900	3,400	100	100	200
Atmospheric scientists	11,000	10,100	(2)	800	(2)
Life scientists	380,200	358,700	8,500	8,600	1,200
Biological scientists	268,200	252,400	6,800	6,000	600
Agricultural scientists	82,200	78,000	1,400	1,700	600
Medical scientists	29,800	28,400	300	800	(2)
Psychologists	156,000	146,600	5,200	1,700	1,000
Social scientists	284,100	247,700	16,200	13,000	1,200
Economists	123,200	107,900	4,700	8,300	700
Sociologists/ anthropologists	67,300	57,700	5,500	1,600	400
Other social scientists	93,600	82,200	5,900	3,100	100
Engineers	1,980,500	1,805,800	43,000	101,100	8,300

Appendix table 2 - (cont.)

Field	Total[1]	White	Black	Asian	Native American
	Total employed				
Total S/E	3,328,500	3,040,000	86,400	149,900	13,500
Total scientists	1,488,900	1,364,700	46,200	54,800	5,700
Physical scientists	225,100	207,400	5,700	9,200	500
Chemists	154,200	140,300	5,100	7,300	400
Physicists/astronomers	45,800	43,300	500	1,300	100
Other physical scientists	25,100	23,800	200	600	(2)
Mathematical scientists	44,600	33,900	2,700	6,900	(2)
Mathematicians	29,100	22,600	1,600	4,000	(2)
Statisticians	15,500	11,300	1,100	2,900	(2)
Computer specialists	382,200	353,600	9,500	14,200	1,200
Environmental scientists	85,700	79,700	500	3,600	700
Earth scientists	72,400	67,600	400	2,800	500
Oceanographers	3,300	2,900	(2)	100	200
Atmospheric scientists	10,000	9,200	(2)	700	(2)
Life scientists	350,900	331,000	8,100	8,000	1,100
Biological scientists	246,400	231,700	6,400	5,500	600
Agricultural scientists	75,700	71,900	1,300	1,600	400
Medical scientists	28,900	27,400	300	800	(2)
Psychologists	144,200	135,800	4,800	1,400	900
Social scientists	256,000	223,400	14,900	11,400	1,200
Economists	112,100	98,200	4,500	7,400	700
Sociologists/anthropologists	61,000	52,500	5,200	1,500	400
Other social scientists	82,900	72,700	5,200	2,600	100
Engineers	1,839,600	1,675,300	40,200	95,100	7,900

Appendix table 2 - (cont.)

Field	*Total*[1]	*White*	*Black*	*Asian*	*Native American*
	S/E employed				
Total S/E	2,901,800	2,650,800	71,800	135,000	11,100
Total scientists	1,196,100	1,097,900	34,800	45,600	4,300
Physical scientists	206,700	191,600	4,900	8,000	500
Chemists	140,900	129,000	4,500	6,100	400
Physicists/astronomers	42,900	40,700	300	1,300	100
Other physical scientists	22,900	21,800	200	600	(2)
Mathematical scientists	40,400	31,000	2,500	6,200	(2)
Mathematicians	26,500	20,700	1,500	3,600	(2)
Statisticians	13,900	10,300	1,000	2,600	(2)
Computer specialists	272,300	250,900	6,600	11,000	800
Environmental scientists	80,700	74,900	400	3,500	700
Earth scientists	68,200	63,600	300	2,800	500
Oceanographers	2,900	2,600	(2)	100	200
Atmospheric scientists	9,600	8,700	(2)	700	(2)
Life scientists	308,600	291,500	7,400	6,600	800
Biological scientists	219,500	206,400	5,900	5,100	400
Agricultural scientists	64,000	61,300	1,200	900	300
Medical scientists	25,100	23,800	300	700	(2)
Psychologists	108,600	103,400	2,600	1,000	500
Social scientists	178,800	154,700	10,400	9,200	1,000
Economists	81,100	69,000	3,900	6,400	600
Sociologists/ anthropologists	40,300	35,500	2,500	1,200	200
Other social scientists	57,400	50,200	4,000	1,600	100
Engineers	1,705,700	1,553,000	37,000	89,300	6,800

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 3 - Women scientists and engineers by field, race, and selected employment status: 1982

Field	Total[1]	White	Black	Asian	Native American
	Total population				
Total S/E	489,700	418,600	32,300	29,000	1,800
Total scientists	417,800	364,300	23,800	22,200	1,300
Physical scientists	30,700	24,800	3,300	2,400	(2)
Chemists	25,400	19,800	3,200	2,300	(2)
Physicists/astronomers	2,900	2,700	100	100	(2)
Other physical sciuntists	2,400	2,300	100	(2)	(2)
Mathematical scientists	22,900	13,800	2,300	5,900	(2)
Mathematicians	13,000	8,200	1,300	2,800	(2)
Statisticians	9,900	5,600	1,000	3,100	(2)
Computer specialists	111,600	99,100	5,300	5,700	200
Environmental scientists	12,100	11,900	100	100	(2)
Earth scientists	10,700	10,500	(2)	100	(2)
Oceanographers	600	600	(2)	(2)	(2)
Atmospheric scientists	900	800	(2)	(2)	(2)
Life scientists	87,900	82,400	1,700	2,300	400
Biological scientists	66,700	62,200	1,300	1,800	400
Agricultural scientists	14,100	13,400	200	400	(2)
Medical scientists	7,100	6,800	100	100	(2)
Psychologists	65,200	60,900	2,600	1,000	300
Social scientists	87,300	71,400	8,600	4,800	400
Economists	24,200	18,400	2,600	2,800	200
Sociologists/ anthropologists	30,600	26,100	2,700	1,000	100
Other social scientists	32,500	26,900	3,300	900	100
Engineers	71,900	54,200	8,500	6,800	500

Appendix table 3 - (cont.)

Field	Total[1]	White	Black	Asian	Native American
	Total employed				
Total S/E	437,100	372,900	29,600	26,200	1,700
Total scientists	372,700	323,900	22,000	20,300	1,300
Physical scientists	26,300	21,300	2,900	2,000	(2)
Chemists	21,700	16,800	2,900	1,800	(2)
Physicists/astronomers	2,500	2,400	100	100	(2)
Other physical scientists	2,100	2,100	(2)	(2)	(2)
Mathematical scientists	20,400	12,200	2,100	5,300	(2)
Mathematicians	11,600	7,100	1,100	2,700	(2)
Statisticians	8,800	5,100	1,000	2,600	(2)
Computer specialists	104,100	92,300	5,100	5,500	200
Environmental scientists	10,400	10,200	100	100	(2)
Earth scientists	9,200	9,000	(2)	(2)	(2)
Oceanographers	400	400	(2)	(2)	(2)
Atmospheric scientists	800	700	(2)	(2)	(2)
Life scientists	77,300	72,200	1,500	2,100	400
Biological scientists	58,000	53,800	1,200	1,700	400
Agricultural scientists	12,500	11,900	200	400	(2)
Medical scientists	6,800	6,500	100	100	(2)
Psychologists	59,000	54,800	2,500	900	300
Social scientists	75,200	60,900	7,800	4,400	400
Economists	20,900	15,800	2,400	2,500	200
Sociologists/ anthropologists	27,000	23,000	2,600	1,000	100
Other social scientists	27,200	22,100	2,800	900	100
Engineers	64,500	48,900	7,600	5,900	400

Appendix table 3 - (cont.)

Field	Total[1]	White	Black	Asian	Native American
			S/E employed		
Total S/E	350,800	298,000	23,300	22,700	1,500
Total scientists	290,700	252,300	16,500	17,000	1,100
Physical scientists	24,200	19,700	2,600	1,800	(2)
Chemists	19,900	15,600	2,500	1,700	(2)
Physicists/astronomers	2,300	2,200	100	100	(2)
Other physical scientists	1,900	1,900	(2)	(2)	(2)
Mathematical scientists	18,100	11,000	1,900	4,800	(2)
Mathematicians	10,300	6,400	1,000	2,500	(2)
Statisticians	7,800	4,600	900	2,300	(2)
Computer specialists	75,000	66,500	3,500	3,900	200
Environmental scientists	9,700	9,500	100	100	(2)
Earth scientists	8,600	8,500	(2)	(2)	(2)
Oceanographers	400	400	(2)	(2)	(2)
Atmospheric scientists	700	600	(2)	(2)	(2)
Life scientists	66,800	62,800	1,300	1,700	200
Biological scientists	50,500	47,100	1,100	1,400	200
Agricultural scientists	10,900	10,400	200	200	(2)
Medical scientists	5,400	5,200	100	100	(2)
Psychologists	41,700	39,200	1,400	600	300
Social scientists	55,100	43,600	5,700	4,100	400
Economists	16,700	11,800	2,200	2,500	200
Sociologists/ anthropologists	17,200	14,900	1,300	700	100
Other social scientists	21,200	16,900	2,300	800	100
Engineers	60,100	45,700	6,800	5,700	400

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 4 - Hispanic scientists and engineers by field, sex, and selected employment status: 1982

Field	Total population			Total employed			S/E employed		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*	*Total*	*Men*	*Women*
Total S/E	79,100	65,900	13,200	74,200	62,600	11,500	61,800	52,700	9,200
Total scientists	33,700	22,800	10,900	30,700	21,200	9,500	22,500	15,200	7,300
Physical scientists	4,600	3,600	1,000	3,800	3,000	800	3,200	2,500	700
Chemists	2,900	2,000	900	2,400	1,700	700	2,100	1,500	600
Physicists/astronomers	1,200	1,100	100	900	800	(1)	700	700	(1)
Other physical scientists	500	500	(1)	500	400	(1)	400	300	(1)
Mathematical scientists	1,200	500	700	1,200	400	700	900	400	500
Mathematicians	900	400	500	900	300	500	600	300	300
Statisticians	300	100	200	300	100	200	300	100	200
Computer specialists	6,000	4,400	1,700	5,900	4,400	1,500	4,500	3,200	1,300
Environmental scientists	1,600	1,400	200	1,500	1,400	200	1,400	1,200	200
Earth scientists	1,400	1,300	100	1,400	1,200	100	1,200	1,100	100
Oceanographers	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Atmospheric scientists	200	200	(1)	100	100	(1)	100	100	(1)
Life scientists	7,500	5,200	2,300	6,700	4,700	2,000	5,300	3,600	1,700
Biological scientists	5,100	3,200	1,900	4,500	2,900	1,600	3,800	2,400	1,300
Agricultural scientists	1,800	1,500	300	1,500	1,300	300	1,100	800	300
Medical scientists	700	500	200	700	500	200	400	300	100
Psychologists	2,900	1,400	1,500	2,700	1,200	1,500	1,500	600	900
Social scientists	9,700	6,300	3,400	8,900	6,100	2,800	5,800	3,800	2,000
Economists	3,000	2,300	700	2,600	2,200	500	2,100	1,600	500
Sociologists/ anthropologists	3,400	2,100	1,300	3,100	2,000	1,100	1,500	1,000	500
Other social scientists	3,400	1,900	1,500	3,200	1,900	1,200	2,200	1,200	1,000
Engineers	45,500	43,100	2,300	43,500	41,500	2,000	39,400	37,500	1,900

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 5 - Doctoral scientists and engineers by field, sex, and selected employment status: 1973, 1979 and 1981

Field and sex	1973			1979			1981		
	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed
Total S/E	238,700	220,200	204,700	331,800	313,100	286,800	363,900	343,500	314,000
Men	217,900	203,300	189,400	293,900	279,900	257,000	318,100	302,500	277,400
Women	20,800	16,900	15,200	37,900	33,200	29,800	45,700	40,900	36,600
Total scientists	201,400	184,400	170,500	280,300	262,900	239,600	305,600	286,600	260,900
Men	180,800	167,700	155,400	243,000	230,200	210,300	260,600	246,400	225,000
Women	20,600	16,700	15,100	37,300	[illegible]2,700	29,300	45,000	40,200	35,900
Physical scientists	53,100	48,500	43,700	64,500	60,200	54,300	67,700	63,200	57,200
Men	50,500	46,600	42,100	60,700	57,100	51,600	63,300	59,400	53,900
Women	2,600	1,900	1,600	3,800	3,100	2,800	4,400	3,800	3,300
Mathematical scientists	13,100	12,100	11,700	16,100	15,300	14,100	16,500	15,600	14,100
Men	12,100	11,300	11,000	14,800	14,200	13,000	15,000	14,300	12,900
Women	1,000	800	700	1,300	1,200	1,100	1,500	1,300	1,200
Computer specialists	2,700	2,700	2,700	6,800	6,700	6,600	9,100	9,000	9,000
Men	2,600	2,600	2,600	6,400	6,400	6,200	8,400	8,300	8,300
Women	100	100	100	400	400	400	700	700	700
Environmental scientists	10,900	10,300	10,100	15,000	14,500	14,100	16,600	16,000	15,300
Men	10,600	10,100	9,800	14,400	13,900	13,500	15,700	15,200	14,500
Women	300	300	200	700	600	600	900	900	800
Life scientists	63,500	58,000	54,500	86,000	80,000	75,900	93,800	86,700	82,300
Men	55,800	51,900	49,000	73,000	68,900	65,400	78,600	73,500	69,900
Women	7,700	6,100	5,400	13,000	11,100	10,500	15,200	13,200	12,400
Psychologists	27,100	24,800	23,400	40,300	37,900	34,900	45,400	43,100	39,400
Men	21,500	20,000	18,900	30,100	28,700	26,600	32,600	31,200	28,800
Women	5,600	4,800	4,500	10,100	9,200	8,300	12,800	11,900	10,700
Social scientists	31,000	27,900	24,400	51,600	48,200	39,700	56,500	52,900	43,600
Men	27,600	25,100	21,900	43,500	41,100	34,000	47,000	44,500	36,800
Women	3,400	2,800	2,500	8,100	7,200	5,800	9,500	8,400	6,800
Engineers	37,300	35,800	34,200	51,500	50,300	47,100	58,300	57,000	53,200
Men	37,100	35,600	34,100	51,000	49,700	46,600	57,500	56,200	52,400
Women	200	100	100	500	500	500	800	800	700

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States* (biennial series, 1977-81) and unpublished data.

Appendix table 6 - Doctoral scientists and engineers by field, race, and selected employment status: 1973, 1979 and 1981

Field and race	1973			1979			1981		
	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed
Total S/E[1]	238,700	220,200	204,700	331,800	313,100	286,800	363,900	343,500	314,000
White	217,800	201,500	187,200	297,000	280,000	256,300	322,900	304,400	278,300
Black	2,200	2,100	1,900	3,600	3,300	2,900	4,600	4,300	3,700
Asian	9,900	9,400	8,800	23,000	22,300	20,900	27,900	26,900	24,900
Native American	900	800	800	2,100	2,000	1,900	2,300	2,200	1,900
Total scientists	201,400	184,400	170,500	280,300	262,900	239,600	305,600	286,600	260,900
White	184,600	169,600	156,800	254,500	238,500	217,300	275,200	257,800	234,900
Black	2,100	2,000	1,800	3,500	3,200	2,800	4,300	4,100	3,500
Asian	7,100	6,700	6,100	15,100	14,600	13,700	18,800	18,000	16,600
Native American	800	700	700	1,800	1,700	1,600	1,900	1,800	1,600
Physical scientists	53,100	48,500	43,700	64,500	60,200	54,300	67,700	63,200	57,200
White	48,200	44,200	39,800	57,900	54,000	48,500	59,700	55,500	50,200
Black	500	500	500	500	400	400	600	600	500
Asian	2,300	2,200	1,900	4,700	4,500	4,300	5,800	5,700	5,300
Native American	100	100	100	400	400	300	300	300	300
Mathematical scientists	13,100	12,100	11,700	16,100	15,300	14,100	16,500	15,600	14,100
White	11,900	11,000	10,700	14,200	13,500	12,400	14,500	13,700	12,400
Black	100	100	100	200	200	200	200	200	200
Asian	600	600	500	1,100	1,100	1,000	1,200	1,200	1,100
Native American	(2)	(2)	(2)	100	100	100	100	100	100
Computer specialists	2,700	2,700	2,700	6,800	6,700	6,600	9,100	9,000	9,000
White	2,500	2,500	2,500	6,100	6,000	5,900	7,900	7,900	7,900
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	100	600	600	500	900	900	900
Native American	(2)	(2)	(2)	100	100	100	(2)	(2)	(2)
Environmental scientists	10,900	10,300	10,100	15,000	14,500	14,100	16,600	16,000	15,300
White	10,300	9,700	9,500	14,200	13,700	13,300	15,500	15,000	14,300
Black	(2)	(2)	(2)	100	100	100	(2)	(2)	(2)
Asian	300	300	300	500	500	500	700	700	700
Native American	(2)	(2)	(2)	100	100	100	100	100	100
Life scientists	63,500	58,000	54,500	86,000	80,000	75,900	93,800	86,700	82,300
White	58,100	53,300	50,100	77,500	72,000	68,300	84,300	77,900	73,900
Black	700	700	600	1,100	1,000	900	1,200	1,100	1,000
Asian	2,600	2,400	2,200	5,400	5,200	5,000	6,400	6,100	5,700
Native American	300	200	200	500	500	500	600	500	500

Appendix table 6 - (cont.)

Field and race	1973			1979			1981		
	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed
Psychologists	27,100	24,800	23,400	40,300	37,900	34,900	45,400	43,100	39,400
White	25,400	23,300	22,000	37,900	35,700	33,000	42,700	40,400	37,100
Black	300	300	200	600	600	500	900	800	700
Asian	200	200	200	400	400	400	600	600	500
Native American	200	200	200	400	400	400	500	500	400
Social scientists	31,000	27,900	24,400	51,600	48,200	39,700	56,500	52,900	43,600
White	28,300	25,600	22,300	46,700	43,700	35,900	50,500	47,400	39,100
Black	400	400	300	1,100	1,000	800	1,400	1,300	1,000
Asian	1,000	1,000	900	2,300	2,300	1,900	3,100	2,800	2,400
Native American	100	100	100	300	300	200	400	400	200
Engineers	37,300	35,800	34,200	51,500	50,300	47,100	58,300	57,000	53,200
White	33,300	31,900	30,500	42,400	41,400	38,900	47,700	46,600	43,400
Black	100	100	100	100	100	100	300	300	200
Asian	2,800	2,700	2,600	7,900	7,700	7,200	9,100	8,900	8,300
Native American	100	100	100	300	300	300	400	400	300

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[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States* (biennial series, 1977-81) and unpublished data.

Appendix table 7 - Women doctoral scientists and engineers by field, race, and selected employment status: 1973, 1979 and 1981

Field and race	1973			1979			1981		
	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed
Total S/E[1]	20,800	16,900	15,200	37,900	33,200	29,900	45,700	40,900	36,600
White	19,000	15,500	14,000	33,800	29,700	26,600	40,700	36,300	32,500
Black	300	200	200	800	700	600	1,100	1,000	900
Asian	800	700	600	2,300	2,100	2,000	3,100	2,800	2,600
Native American	100	100	100	200	200	200	300	300	300
Total scientists	20,600	16,700	15,100	37,300	32,700	29,300	45,000	40,200	35,900
White	18,800	15,400	13,900	33,400	29,200	26,200	40,000	35,700	31,900
Black	300	200	200	800	700	600	1,100	1,000	900
Asian	800	600	600	2,200	2,000	1,900	3,000	2,700	2,500
Native American	100	100	100	200	200	200	300	300	300
Physical scientists	2,600	1,900	1,600	3,800	3,100	2,800	4,400	3,800	3,300
White	2,300	1,700	1,500	3,100	2,600	2,300	3,500	3,000	2,700
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	200	200	100	600	500	400	700	600	600
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical scientists	1,000	800	700	1,300	1,200	1,100	1,500	1,300	1,200
White	900	700	700	1,100	1,000	900	1,200	1,100	1,000
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	100	100	100	100	200	200	200
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	100	100	100	400	400	400	700	700	700
White	100	100	100	300	300	300	600	600	600
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	100	100	100	100	100	100
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	300	300	200	700	600	600	900	900	800
White	300	200	200	600	600	500	800	800	800
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	100	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	7,700	6,100	5,400	13,300	11,100	10,500	15,200	13,200	12,400
White	7,000	5,500	5,000	11,400	9,800	9,100	13,300	11,500	10,700
Black	100	100	100	300	300	200	300	300	300
Asian	400	300	300	1,000	900	900	1,400	1,200	1,200
Native American	100	(2)	(2)	100	100	100	100	100	100

Appendix table 7 - (cont.)

Field and race	1973			1979			1981		
	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed	Total population	Total employed	S/E employed
Psychologists	5,600	4,800	4,500	10,100	9,200	8,300	12,800	11,900	10,700
White	5,200	4,400	4,200	9,400	8,500	7,800	11,900	11,000	9,900
Black	100	100	100	200	200	200	400	400	300
Asian	100	100	100	200	200	100	300	200	200
Native American	(2)	(2)	(2)	100	100	100	100	100	100
Social scientists	3,400	2,800	2,500	8,100	7,200	6,600	9,500	8,400	6,800
White	3,200	2,600	2,300	7,400	6,600	5,300	8,700	7,700	6,300
Black	(2)	(2)	(2)	200	200	200	300	300	200
Asian	100	(2)	(2)	200	200	200	300	300	200
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Engineers	200	100	100	500	500	500	800	800	700
White	100	100	100	400	400	400	600	600	600
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	100	100	100	100	100	100
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States* (biennial series, 1977-81) and unpublished data.

Appendix table 8 - Doctoral scientists and engineers by field, sex, and selected employment status: 1981

Field	Total population			Total employed			S/E employed		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	363,900	318,100	45,700	343,500	302,600	40,900	314,000	277,400	36,600
Total scientists	305,600	260,600	45,000	286,600	246,400	40,200	260,900	225,000	35,900
Physical scientists	67,700	63,300	4,400	63,200	59,400	3,800	57,200	53,900	3,300
Chemists	45,400	41,700	3,700	42,000	38,800	3,200	38,100	35,400	2,800
Physicists/astronomers	22,300	21,600	700	21,200	20,600	600	19,000	18,500	500
Mathematical scientists	16,500	15,000	1,500	15,600	14,300	1,300	14,100	12,900	1,200
Mathematicians	13,800	12,700	1,200	13,000	12,000	1,000	11,700	10,800	900
Statisticians	2,700	2,400	300	2,600	2,300	300	2,400	2,100	300
Computer specialists	9,100	8,400	700	9,000	8,300	700	9,000	8,300	700
Environmental scientists	16,600	15,700	900	16,000	15,200	900	15,300	14,500	800
Earth scientists	12,600	12,000	600	12,100	11,500	600	11,500	11,000	500
Oceanographers	1,800	1,600	200	1,800	1,600	200	1,700	1,500	200
Atmospheric scientists	2,200	2,100	100	2,100	2,000	100	2,100	2,000	100
Life scientists	93,800	78,600	15,200	86,700	73,500	13,200	82,300	69,900	12,400
Biological scientists	54,400	43,800	10,600	49,700	40,600	9,000	46,800	38,500	8,300
Agricultural scientists	17,300	16,700	500	15,900	15,400	400	14,800	14,400	400
Medical scientists	22,100	18,100	4,000	21,200	17,400	3,800	20,700	17,000	3,700
Psychologists	45,400	32,600	12,800	43,100	31,200	11,900	39,400	28,800	10,700
Social scientists	56,500	47,000	9,500	52,900	44,500	8,400	43,600	36,800	6,800
Economists	14,300	13,000	1,300	13,400	12,300	1,100	11,100	10,100	900
Sociologists/ anthropologists	11,900	8,600	3,300	11,000	8,100	2,900	9,100	6,600	2,500
Other social scientists	30,300	25,300	5,000	28,500	24,200	4,400	23,400	20,000	3,400
Engineers	58,300	57,500	800	57,000	56,200	800	53,200	52,400	700

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332) and unpublished data.

Appendix table 9 - Doctoral scientists and engineers by field, race, and selected employment status: 1981

Field	Total population					Total employed				
	Total[1]	White	Black	Asian	Native American	Total[1]	White	Black	Asian	Native American
Total S/E	363,900	322,900	4,600	27,900	2,300	343,500	304,400	4,300	26,900	2,200
Total scientists	305,600	275,200	4,300	18,800	1,900	286,600	257,800	4,100	18,000	1,800
Physical scientists	67,700	59,700	600	5,800	300	63,200	55,500	600	5,700	300
Chemists	45,400	40,200	400	3,900	200	42,000	36,900	400	3,800	200
Physicists/astronomers	22,300	19,600	300	1,900	100	21,200	18,600	200	1,900	100
Mathematical scientists	16,500	14,500	200	1,200	100	15,600	13,700	200	1,200	100
Mathematicians	13,800	12,300	200	900	100	13,000	11,600	200	900	100
Statisticians	2,700	2,200	(2)	300	(2)	2,600	2,100	(2)	300	(2)
Computer specialists	9,100	7,900	(2)	900	(2)	9,000	7,900	(2)	900	(2)
Environmental scientists	16,600	15,500	(2)	700	100	16,000	15,000	(2)	700	100
Earth scientists	12,600	11,800	(2)	500	(2)	12,100	11,400	(2)	500	(2)
Oceanographers	1,800	1,700	(2)	100	(2)	1,800	1,700	(2)	100	(2)
Atmospheric scientists	2,200	2,000	(2)	100	(2)	2,100	2,000	(2)	100	(2)
Life scientists	93,800	84,300	1,200	6,400	600	86,700	77,900	1,100	6,100	500
Biological scientists	54,400	48,700	700	4,000	300	49,700	44,300	600	3,800	300
Agricultural scientists	17,300	16,000	200	800	100	15,900	14,800	200	700	100
Medical scientists	22,100	19,700	300	1,600	100	21,200	18,800	300	1,600	100
Psychologists	45,400	42,700	900	600	500	43,100	40,400	800	600	500
Social scientists	56,500	50,500	1,400	3,100	400	52,900	47,400	1,300	2,800	400
Economists	14,300	12,600	200	1,200	200	13,400	11,800	200	1,100	200
Sociologists/ anthropologists	11,900	10,800	300	400	100	11,000	10,000	300	300	100
Other social scientists	30,300	27,100	800	1,500	100	28,500	25,600	800	1,400	100
Engineers	58,300	47,700	300	9,100	400	57,000	46,600	300	8,900	400

Appendix table 9 - (cont.)

Field	S/E employed				
	Total[1]	*White*	*Black*	*Asian*	*Native American*
Total S/E	314,000	278,300	3,700	24,900	1,900
Total scientists	260,900	234,900	3,500	16,600	1,600
Physical scientists	57,200	50,200	500	5,300	300
Chemists	38,100	33,600	300	3,500	200
Physicists/astronomers	19,000	16,600	200	1,700	100
Mathematical scientists	14,100	12,400	200	1,100	100
Mathematicians	11,700	10,400	200	800	100
Statisticians	2,400	2,000	(2)	200	(2)
Computer specialists	9,000	7,900	(2)	900	(2)
Environmental scientists	15,300	14,300	(2)	700	100
Earth scientists	11,500	10,800	(2)	500	(2)
Oceanographers	1,700	1,600	(2)	100	(2)
Atmospheric scientists	2,100	1,900	(2)	100	(2)
Life scientists	82,300	73,900	1,000	5,700	500
Biological scientists	46,800	41,700	500	3,600	300
Agricultural scientists	14,800	13,800	200	600	100
Medical scientists	20,700	18,400	300	1,500	100
Psychologists	39,400	37,100	700	500	400
Social scientists	43,600	39,100	1,000	2,400	200
Economists	11,100	9,700	100	1,100	100
Sociologists/anthropologists	9,100	8,300	200	300	(2)
Other social scientists	23,400	21,200	600	1,000	(2)
Engineers	53,200	43,400	200	8,300	300

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332) and unpublished data.

Appendix table 10 - Women doctoral scientists and engineers by field, race, and selected employment status: 1981

Field	Total population					Total employed				
	Total[1]	White	Black	Asian	Native American	Total[1]	White	Black	Asian	Native American
Total S/E	45,700	40,700	1,100	3,100	300	40,900	36,300	1,000	2,800	300
Total scientists	45,000	40,000	1,100	3,000	300	40,200	35,700	1,000	2,700	300
Physical scientists	4,400	3,500	(2)	700	(2)	3,800	3,000	(2)	600	(2)
Chemists	3,700	2,900	(2)	600	(2)	3,200	2,500	(2)	600	(2)
Physicists/astronomers	700	600	(2)	100	(2)	600	500	(2)	100	(2)
Mathematical scientists	1,500	1,200	(2)	200	(2)	1,300	1,100	(2)	200	(2)
Mathematicians	1,200	1,000	(2)	100	(2)	1,000	900	(2)	100	(2)
Statisticians	300	200	(2)	100	(2)	300	200	(2)	100	(2)
Computer specialists	700	600	(2)	100	(2)	700	600	(2)	100	(2)
Environmental scientists	900	800	(2)	100	(2)	900	800	(2)	(2)	(2)
Earth scientists	600	600	(2)	(2)	(2)	600	500	(2)	(2)	(2)
Oceanographers	200	200	(2)	(2)	(2)	200	200	(2)	(2)	(2)
Atmospheric scientists	100	100	(2)	(2)	(2)	100	100	(2)	(2)	(2)
Life scientists	15,200	13,300	300	1,400	100	13,200	11,500	300	1,200	100
Biological scientists	10,600	9,300	200	900	100	9,000	7,800	200	800	100
Agricultural scientists	500	400	(2)	100	(2)	400	300	(2)	100	(2)
Medical scientists	4,000	3,600	100	300	(2)	3,800	3,300	100	300	(2)
Psychologists	12,800	11,900	400	300	100	11,900	11,000	400	200	100
Social scientists	9,500	8,700	300	300	(2)	8,400	7,700	300	300	(2)
Economists	1,300	1,200	(2)	100	(2)	1,100	1,000	(2)	100	(2)
Sociologists/ anthropologists	3,300	3,000	100	100	(2)	2,900	2,700	100	100	(2)
Other social scientists	5,000	4,500	200	200	(2)	4,400	4,000	200	100	(2)
Engineers	800	600	(2)	100	(2)	800	600	(2)	100	(2)

Appendix table 10 - (cont.)

Field	S/E employed				
	Total[1]	*White*	*Black*	*Asian*	*Native American*
Total S/E	36,600	32,500	900	2,600	300
Total scientists	35,900	31,900	900	2,500	300
Physical scientists	3,300	2,700	(2)	600	(2)
Chemists	2,800	2,200	(2)	500	(2)
Physicists/astronomers	500	500	(2)	100	(2)
Mathematical scientists	1,200	1,000	(2)	200	(2)
Mathematicians	900	800	(2)	100	(2)
Statisticians	300	200	(2)	100	(2)
Computer specialists	700	600	(2)	100	(2)
Environmental scientists	800	800	(2)	(2)	(2)
Earth scientists	500	500	(2)	(2)	(2)
Oceanographers	200	200	(2)	(2)	(2)
Atmospheric scientists	100	100	(2)	(2)	(2)
Life scientists	12,400	10,700	300	1,200	100
Biological scientists	8,300	7,200	200	800	100
Agricultural scientists	400	300	(2)	100	(2)
Medical scientists	3,700	3,200	100	300	(2)
Psychologists	10,700	9,900	300	200	100
Social scientists	6,800	6,300	200	200	(2)
Economists	900	900	(2)	100	(2)
Sociologists/ anthropologists	2,500	2,300	100	100	(2)
Other social scientists	3,400	3,100	100	100	(2)
Engineers	700	600	(2)	100	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332) and unpublished data.

Appendix table 11 - Hispanic doctoral scientists and engineers by field, sex, and selected employment status: 1981

Field	Total population			Total employed			S/E employed		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	5,000	4,400	600	4,800	4,200	600	4,300	3,800	500
Total scientists	4,300	3,700	600	4,100	3,500	600	3,700	3,200	500
Physical scientists	900	900	100	900	800	100	700	700	(1)
Chemists	600	600	100	600	500	(1)	500	400	(1)
Physicists/astronomers	300	300	(1)	300	300	(1)	200	200	(1)
Mathematical scientists	300	200	(1)	200	200	(1)	200	200	(1)
Mathematicians	200	200	(1)	200	200	(1)	200	200	(1)
Statisticians	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Computer specialists	100	100	(1)	100	100	(1)	100	100	(1)
Environmental scientists	100	100	(1)	100	100	(1)	100	100	(1)
Earth scientists	100	100	(1)	100	100	(1)	100	100	(1)
Oceanographers	100	(1)	(1)	100	(1)	(1)	100	(1)	(1)
Atmospheric scientists	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Life scientists	1,300	1,100	200	1,200	1,000	200	1,100	1,000	200
Biological scientists	600	500	100	600	500	100	600	500	100
Agricultural scientists	200	200	(1)	200	200	(1)	200	200	(1)
Medical scientists	400	300	100	400	300	100	300	300	100
Psychologists	700	500	100	600	500	100	600	500	100
Social scientists	900	700	200	900	700	200	800	600	100
Economists	300	300	(1)	300	300	(1)	300	300	(1)
Sociologists/anthropologists	200	200	(1)	200	100	(1)	200	100	(1)
Other social scientists	400	300	100	400	300	100	300	200	100
Engineers	700	700	(1)	700	700	(1)	600	600	(1)

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 12 - Selected characteristics of physically - handicapped scientists and engineers: 1982

Characteristic	Total	Total Employed
FIELD		
Total S/E	85,200	66,800
Total scientists	35,400	30,400
Physical scientists	7,900	6,600
Mathematical scientists	700	500
Computer specialists	7,000	6,500
Environmental scientists	2,000	1,600
Life scientists	7,700	7,000
Psychologists	4,500	3,600
Social scientists	5,700	4,700
Engineers	49,800	36,400
SEX		
Men	79,900	62,700
Women	5,300	4,100
RACE		
White	80,600	62,600
Black	1,600	1,400
Asian	1,200	1,000
Native American	900	900
Other/No report	900	900

Characteristic	Total	Total Employed
AGE		
Under 30	6,000	5,200
30-34	7,900	7,300
35-39	7,400	6,900
40-44	8,500	7,800
45-49	7,500	6,700
50-54	10,100	9,300
55-59	16,100	14,000
60-64	12,600	6,200
65-69	5,500	2,100
70 & over	3,400	1,100
No report	200	200
EMPLOYMENT STATUS		
Full-time employed	(1)	61,400
S/E occupation	(1)	56,000
Non-S/E occupation	(1)	5,500
Part-time employed	(1)	4,600
S/E occupation	(1)	3,600
Non-S/E occupation	(1)	1,000
Employed, Full/Part status unknown	(1)	800
Unemployed/seeking	1,900	(1)
Retired/other	16,500	(1)
No report	700	(1)

Characteristic	Total	Total Employed
TYPE OF EMPLOYER		
Business/industry	(1)	36,900
Educational institutions	(1)	7,400
Hospitals/clinics	(1)	1,100
Nonprofit organizations	(1)	1,600
Federal Government	(1)	8,000
State/local government	(1)	5,000
Other	(1)	6,000
No report	(1)	700
PRIMARY WORK ACTIVITY		
Research & development	(1)	20,100
Basic research	(1)	1,800
Applied research	(1)	4,300
Development	(1)	14,000
Management of R&D	(1)	5,700
Other management	(1)	11,200
Teaching	(1)	5,000
Sales/distribution	(1)	1,700
Production/inspection	(1)	6,700
Other	(1)	14,500
No report	(1)	1,800

[1] Not applicable

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision

SOURCE: National Science Foundation, unpublished data.

Appendix table 13 - Selected characteristics of physically - handicapped doctoral scientists and engineers: 1981

Characteristic	Total	Total Employed
FIELD		
Total S/E	10,200	8,300
Total scientists	8,800	7,100
Physical scientists	1,800	1,400
Mathematical scientists	400	300
Computer specialists	100	100
Environmental scientists	600	500
Life scientists	2,700	2,100
Psychologists	1,300	1,100
Social scientists	1,900	1,500
Engineers	1,400	1,200
SEX		
Men	9,000	7,400
Women	1,300	900
RACE		
White	9,500	7,700
Black	100	(1)
Asian	400	300
Native American	100	100

Characteristic	Total	Total Employed
AGE		
Under 30	100	100
30-39	1,800	1,700
40-44	1,300	1,300
45-49	1,200	1,100
50-54	1,400	1,300
55-59	1,500	1,300
60-64	1,200	800
65-69	900	500
70 & Over	800	200
No report	100	(1)
EMPLOYMENT STATUS		
Full-time employed	(1)	7,900
S/E occupation	(1)	7,000
Non-S/E occupation	(1)	900
Part-time employed	(1)	400
S/E occupation	(1)	300
Non-S/E occupation	(1)	100
Employed, Full/Part status unknown	(1)	400
Unemployed/seeking	100	(2)
Retired/other	1,800	(2)
No report	(1)	(2)

Characteristic	Total	Total Employed
TYPE OF EMPLOYER		
Business/industry	(1)	2,100
Educational institutions	(1)	7,400
Nonprofit organizations	(1)	200
Federal Government	(1)	700
State/local government	(1)	200
Other	(1)	300
No report	(1)	100
PRIMARY WORK ACTIVITY		
Research & development	(2)	2,700
Management of R&D	(2)	700
Management of other	(2)	500
Teaching	(2)	2,800
Consulting	(2)	300
Professional services to individuals	(2)	600
Other and no report	(2)	700

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[1] Too few cases to estimate.

[2] Not applicable.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision

SOURCE: National Science Foundation, unpublished data.

Appendix table 14 - Scientists and engineers by field, sex, and primary work activity: 1982

Field and sex	*Total employed*	*Research and development*	*Management of R&D*	*Management of other than R&D*	*Teaching*	*Quality control/ operations*	*Reporting/ statistical/ computing*	*Other and no report*
Total S/E	3,328,500	1,005,200	270,500	564,300	217,800	417,500	337,900	515,300
Men	2,891,300	892,500	251,200	518,700	162,000	384,500	245,200	437,300
Women	437,100	112,700	19,300	45,500	55,800	33,000	92,800	78,000
Total scientists	1,488,900	378,600	108,600	222,700	187,800	100,700	259,400	231,200
Men	1,116,200	289,500	92,000	183,200	134,100	80,400	174,500	162,500
Women	372,700	89,100	16,600	39,500	53,600	20,300	84,900	68,700
Physical scientists	225,100	97,100	29,600	24,000	27,100	25,800	4,800	16,700
Men	198,800	85,200	28,600	22,300	23,900	20,800	3,500	14,500
Women	26,300	11,900	1,000	1,700	3,200	5,000	1,300	2,200
Mathematical scientists	44,600	7,400	2,000	1,800	21,700	500	9,200	2,100
Men	24,200	4,300	1,000	1,100	13,300	300	3,100	1,200
Women	20,400	3,100	1,000	700	8,400	200	6,100	900
Computer specialists	382,200	70,000	21,100	33,300	8,900	10,900	196,700	41,300
Men	278,100	50,500	16,700	27,600	5,400	8,300	137,500	32,000
Women	104,100	19,500	4,400	5,700	3,500	2,600	59,200	9,300
Environmental scientists	85,700	36,600	7,500	10,800	5,000	8,700	5,200	11,900
Men	75,400	30,600	7,000	10,300	4,200	8,100	4,400	10,800
Women	10,400	6,000	500	500	800	500	900	1,100
Life scientists	350,900	120,100	25,000	65,800	47,500	37,400	10,200	44,900
Men	273,600	87,400	22,100	57,500	35,500	30,000	6,900	34,200
Women	77,300	32,700	2,900	8,300	12,100	7,400	3,300	10,700
Psychologists	144,200	10,900	5,700	23,900	28,000	6,200	3,400	66,100
Men	85,300	6,400	4,000	15,300	17,600	3,900	1,600	36,500
Women	59,000	4,500	1,700	8,600	10,500	2,300	1,900	29,600
Social scientists	256,000	36,500	17,800	63,000	49,500	11,200	29,800	48,200
Men	180,800	25,200	12,600	49,100	34,300	8,900	17,500	33,300
Women	75,200	11,300	5,200	13,900	15,200	2,300	12,300	14,900
Engineers	1,839,600	626,700	161,900	341,600	30,100	316,800	78,600	284,100
Men	1,775,100	603,000	159,200	335,500	27,900	304,100	70,700	274,800
Women	64,500	23,700	2,700	6,100	2,200	12,700	7,900	9,300

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 15 - Scientists and engineers by field, race, and primary work activity: 1982

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Quality control/ operations	Reporting/ statistical/ computing	Other and no report
Total S/E[1]	3,328,500	1,005,200	270,500	564,300	217,800	417,500	337,900	515,300
White	3,040,000	908,100	249,700	526,000	198,400	379,500	306,100	472,300
Black	86,400	20,800	4,600	15,300	7,200	12,800	12,300	13,400
Asian	149,900	61,000	11,200	15,100	8,900	17,400	15,200	21,000
Native American	13,500	3,000	1,500	2,700	900	2,200	900	2,400
Total scientists	1,488,900	378,600	108,600	222,700	187,800	100,700	259,400	231,200
White	1,364,700	345,300	99,900	206,700	171,900	91,600	235,700	213,700
Black	46,200	8,200	2,200	8,900	6,200	3,900	9,400	7,400
Asian	54,800	19,400	3,700	4,000	7,100	3,500	11,200	5,900
Native American	5,700	1,000	900	1,200	700	500	600	800
Physical scientists	225,100	97,100	29,600	24,000	27,100	25,800	4,800	16,700
White	207,400	89,300	27,900	22,300	25,900	22,700	4,300	15,200
Black	5,700	2,000	300	700	300	1,400	300	800
Asian	9,200	4,600	1,200	700	700	1,300	200	600
Native American	500	300	100	(2)	100	(2)	(2)	(2)
Mathematical scientists	44,600	7,400	2,000	1,800	21,700	500	9,200	2,100
White	33,900	5,600	1,300	1,300	17,900	300	6,100	1,400
Black	2,700	200	(2)	200	1,200	(2)	800	200
Asian	6,900	1,500	500	200	2,200	100	2,000	300
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	382,200	70,000	21,100	33,300	8,900	10,900	196,700	41,300
White	353,600	62,600	19,900	31,500	8,100	10,200	182,900	38,400
Black	9,500	1,400	300	500	300	400	5,300	1,200
Asian	14,200	4,800	500	1,000	200	300	6,200	1,200
Native American	1,200	200	200	(2)	200	(2)	500	(2)
Environmental scientists	85,700	36,600	7,500	10,800	5,000	8,700	5,200	11,900
White	79,700	34,300	6,600	10,000	4,800	7,800	4,800	11,300
Black	500	200	(2)	100	(2)	100	100	(2)
Asian	3,600	1,500	400	400	100	600	300	400
Native American	700	200	200	200	(2)	(2)	(2)	100
Life scientists	350,900	120,100	25,000	65,800	47,500	37,400	10,200	44,900
White	331,000	112,300	24,000	62,900	44,700	35,200	9,800	42,100
Black	8,100	2,900	400	1,300	1,200	800	300	1,100
Asian	8,000	3,500	500	600	1,100	1,000	100	1,100
Native American	1,100	300	(2)	600	100	(2)	(2)	100

Appendix table 15 - (cont.)

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Quality control/ operations	Reporting/ statistical/ computing	Other and no report
Psychologists	144,200	10,900	5,700	23,900	28,000	6,200	3,400	66,100
White	135,800	10,200	5,500	22,500	26,400	5,400	2,900	62,800
Black	4,800	200	100	1,200	700	400	400	1,800
Asian	1,400	200	100	(2)	400	(2)	100	500
Native American	900	(2)	(2)	100	200	300	(2)	400
Social scientists	256,000	36,500	17,800	63,000	49,500	11,200	29,800	48,200
White	223,400	31,000	14,700	56,200	44,000	10,000	24,800	42,600
Black	14,900	1,300	1,100	4,700	2,500	900	2,200	2,300
Asian	11,400	3,300	500	1,000	2,300	200	2,400	1,800
Native American	1,200	100	400	200	300	100	100	200
Engineers	1,839,600	626,700	161,900	341,600	30,100	316,800	78,600	284,100
White	1,675,300	562,800	149,700	319,300	26,500	287,900	70,400	258,600
Black	40,200	12,500	2,400	6,400	1,000	8,900	3,000	5,900
Asian	95,100	41,600	7,600	11,000	1,900	13,900	4,000	15,100
Native American	7,900	2,000	600	1,500	100	1,700	300	1,600

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 16 - Women scientists and engineers by field, race, and primary work activity: 1982

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Quality control/ operations	Reporting/ statistical/ computing	Other and no report
Total S/E[1]	437,100	112,700	19,300	45,500	55,800	33,000	92,800	78,000
White	372,900	95,000	15,800	39,000	49,100	27,200	78,500	68,300
Black	29,600	5,900	1,400	4,000	3,100	3,600	6,500	5,100
Asian	26,200	9,500	1,400	1,500	2,700	1,700	6,600	2,700
Native American	1,700	300	100	300	300	100	300	400
Total scientists	372,700	89,100	16,600	39,500	53,600	20,300	84,900	68,700
White	323,900	77,400	13,700	34,400	47,400	17,500	72,600	61,100
Black	22,000	3,900	1,100	2,900	2,900	2,000	5,400	3,800
Asian	20,300	6,600	1,100	1,200	2,600	700	3,000	2,100
Native American	1,300	(2)	100	300	300	(2)	200	300
Physical scientists	26,300	11,900	1,000	1,700	3,200	5,000	1,300	2,200
White	21,300	9,500	900	1,400	3,100	3,800	1,100	1,600
Black	2,900	1,300	100	200	100	600	200	500
Asian	2,000	1,000	(2)	100	(2)	600	100	100
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical scientists	20,400	3,100	1,000	700	8,400	200	6,100	900
White	12,200	1,700	300	300	5,900	200	3,300	500
Black	2,100	200	(2)	200	900	(2)	800	(2)
Asian	5,300	1,200	500	200	1,300	(2)	1,800	300
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	104,100	19,500	4,400	5,700	3,500	2,600	59,200	9,300
White	92,300	16,700	3,900	5,100	3,300	2,300	53,000	7,900
Black	5,100	600	200	200	100	300	3,000	800
Asian	5,500	1,800	300	300	100	(2)	2,500	500
Native American	200	(2)	(2)	(2)	(2)	(2)	200	(2)
Environmental scientists	10,400	6,000	500	500	800	500	900	1,100
White	10,200	5,900	500	500	800	500	900	1,000
Black	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	77,300	32,700	2,900	8,300	12,100	7,400	3,300	10,700
White	72,200	30,800	2,700	7,500	11,600	7,100	3,200	9,400
Black	1,500	700	(2)	(2)	200	100	(2)	400
Asian	2,100	800	200	300	200	100	(2)	600
Native American	400	(2)	(2)	300	(2)	(2)	(2)	(2)

Appendix table 16 - (cont.)

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Quality control/ operations	Reporting/ statistical/ computing	Other and no report
Psychologists	59,000	4,500	1,700	8,600	10,500	2,300	1,900	29,600
White	54,800	4,100	1,600	8,200	9,400	1,900	1,500	28,000
Black	2,500	200	100	300	400	400	200	900
Asian	900	200	(2)	(2)	400	(2)	100	200
Native American	300	(2)	(2)	(2)	200	(2)	(2)	100
Social scientists	75,200	11,300	5,200	13,900	15,200	2,300	12,300	14,900
White	60,900	8,600	3,800	11,300	13,400	1,700	9,600	12,500
Black	7,800	900	800	2,000	1,100	600	1,200	1,200
Asian	4,400	1,600	200	200	600	(2)	1,500	400
Native American	400	(2)	100	(2)	100	(2)	(2)	200
Engineers	64,500	23,700	2,700	6,100	2,200	12,700	7,900	9,300
White	48,900	17,700	2,100	4,600	1,700	9,700	5,900	7,200
Black	7,600	2,000	200	1,100	300	1,600	1,100	1,300
Asian	5,900	2,900	300	300	200	1,000	700	600
Native American	400	200	(2)	(2)	(2)	100	100	100

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 17 - Hispanic scientists and engineers by field, sex, and primary work activity: 1982

Field and sex	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Quality control/ operations	Reporting/ statistical/ computing	Other and no report
Total S/E	74,200	22,100	5,700	11,100	4,300	12,000	6,400	12,600
Men	62,600	18,900	5,400	9,600	2,900	10,800	4,300	10,800
Women	11,500	3,200	300	1,500	1,500	1,200	2,100	1,800
Total scientists	30,700	7,200	2,600	4,000	3,700	2,100	4,800	6,300
Men	21,200	4,800	2,300	2,600	2,200	1,500	2,900	4,700
Women	9,500	2,400	200	1,400	1,400	500	1,900	1,600
Physical scientists	3,800	1,400	500	500	500	400	100	400
Men	3,000	900	500	400	400	300	100	400
Women	800	500	(1)	(1)	100	100	(1)	(1)
Mathematical scientists	1,200	100	(1)	(1)	500	(1)	400	300
Men	400	100	(1)	(1)	200	(1)	(1)	100
Women	700	(1)	(1)	(1)	300	(1)	400	100
Computer specialists	5,900	1,200	200	700	100	(1)	2,700	1,000
Men	4,400	900	200	400	(1)	(1)	1,900	1,000
Women	1,500	400	100	300	100	(1)	800	(1)
Environmental scientists	1,500	700	200	100	100	200	100	200
Men	1,400	600	200	100	100	200	100	200
Women	200	100	(1)	(1)	(1)	(1)	(1)	(1)
Life scientists	6,700	2,800	100	900	800	600	100	1,500
Men	4,700	1,800	(1)	600	500	500	100	1,200
Women	2,000	1,000	(1)	300	300	100	(1)	300
Psychologists	2,700	200	(1)	300	400	200	200	1,300
Men	1,200	200	(1)	100	100	200	(1)	600
Women	1,500	100	(1)	200	300	100	200	700
Social scientists	8,900	900	1,600	1,500	1,300	600	1,300	1,600
Men	6,100	500	1,500	1,000	900	400	700	1,200
Women	2,800	400	100	600	400	300	600	400
Engineers	43,500	14,800	3,100	7,100	600	10,000	1,600	6,200
Men	41,500	14,100	3,100	6,900	600	9,300	1,400	6,000
Women	2,000	800	(1)	200	(1)	700	200	200

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[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 18 - Doctoral scientists and engineers by field, sex, and primary work activity: 1981

Field and sex	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Consulting	Professional services to indiv.	Other and no report
Total S/E	343,500	120,100	32,600	27,700	105,000	12,000	23,100	23,000
Men	302,600	107,800	31,100	24,200	91,000	11,000	17,500	20,000
Women	40,900	12,300	1,500	3,500	13,900	1,100	5,600	3,000
Total scientists	286,600	96,700	22,300	22,800	94,200	8,200	22,400	19,900
Men	246,400	84,800	20,900	19,300	80,400	7,200	16,800	16,900
Women	40,200	11,900	1,400	3,500	13,300	1,000	5,600	2,900
Physical scientists	63,200	29,700	8,700	3,200	15,600	1,100	800	4,100
Men	59,400	27,900	8,500	3,000	14,500	1,100	800	3,800
Women	3,800	1,800	200	200	1,100	(1)	100	300
Mathematical scientists	15,600	3,400	300	1,000	9,600	500	200	600
Men	14,300	3,200	300	1,000	8,700	400	200	600
Women	1,300	200	(1)	(1)	900	100	(1)	(1)
Computer specialists	9,000	4,500	800	900	1,300	600	200	600
Men	8,300	4,100	800	900	1,400	500	100	500
Women	700	400	(1)	(1)	100	(1)	(1)	100
Environmental scientists	16,000	6,300	2,400	1,200	3,600	1,000	300	1,100
Men	15,200	5,900	2,300	1,200	3,400	1,000	300	1,000
Women	900	400	100	100	200	100	(1)	100
Life scientists	86,700	39,900	6,800	5,700	22,000	1,600	4,800	6,000
Men	73,500	33,300	6,300	4,800	18,400	1,500	4,100	5,100
Women	13,200	6,600	500	900	3,600	200	600	900
Psychologists	43,100	5,400	1,100	4,800	12,600	2,100	15,100	2,100
Men	31,200	4,200	800	3,500	9,300	1,600	10,400	1,400
Women	11,900	1,200	200	1,300	3,300	500	4,700	700
Social scientists	52,900	7,600	2,300	6,000	29,300	1,400	1,100	5,400
Men	44,500	6,200	1,900	5,100	24,700	1,200	900	4,600
Women	8,400	1,400	400	1,000	4,600	200	200	700
Engineers	57,000	23,400	10,300	4,900	10,700	3,800	700	3,100
Men	56,200	23,000	10,200	4,900	10,600	3,800	700	3,000
Women	800	400	100	(1)	100	100	(1)	100

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332) and unpublished data.

Appendix table 19 - Doctoral scientists and engineers by field, race, and primary work activity: 1981

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Consulting	Professional services to indiv.	Other and no report
Total S/E[1]	343,500	120,100	32,600	27,700	105,000	12,000	23,100	23,000
White	304,400	102,800	29,200	25,800	94,100	10,600	21,300	20,600
Black	4,300	900	300	700	1,700	100	300	300
Asian	26,900	13,900	2,600	700	6,200	1,000	800	1,700
Native American	2,200	600	100	200	800	100	300	100
Total scientists	286,600	96,700	22,300	22,800	94,200	8,200	22,400	19,900
White	257,800	85,400	20,300	21,200	84,600	7,700	20,700	17,900
Black	4,100	800	300	600	1,700	100	300	300
Asian	18,000	8,600	1,400	500	5,300	200	700	1,300
Native American	1,800	400	100	100	700	100	300	100
Physical scientists	63,200	29,200	8,700	3,200	15,600	1,100	800	4,100
White	55,500	25,100	8,000	2,900	14,100	1,100	700	3,700
Black	600	200	100	100	200	(2)	(2)	(2)
Asian	5,700	3,800	600	100	800	(2)	100	300
Native American	300	100	(2)	(2)	100	(2)	(2)	(2)
Mathematical scientists	15,600	3,400	300	1,000	9,600	500	200	600
White	13,700	3,000	300	900	8,400	400	200	500
Black	200	(2)	(2)	(2)	100	(2)	(2)	(2)
Asian	1,200	200	(2)	(2)	800	(2)	(2)	100
Native American	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	9,000	4,500	800	900	1,500	600	200	600
White	7,900	3,900	700	800	1,300	500	100	500
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	900	500	(2)	(2)	200	(2)	(2)	100
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	16,000	6,300	2,400	1,200	3,600	1,000	300	1,100
White	15,000	5,900	2,200	1,200	3,400	1,000	300	1,000
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	700	300	200	(2)	100	100	(2)	100
Native American	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	86,700	39,900	6,800	5,700	22,000	1,600	4,800	6.000
White	77,900	35,400	6,200	5,300	19,800	1,600	4,200	5,400
Black	1,100	300	100	100	400	(2)	100	100
Asian	6,100	2,500	400	100	1,700	(2)	300	400
Native American	500	200	100	(2)	100	(2)	(2)	100

Appendix table 19 - (cont.)

Field and race	*Total employed*	*Research and development*	*Management of R&D*	*Management of other than R&D*	*Teaching*	*Consulting*	*Professional services to indiv.*	*Other and no report*
Psychologists	43,100	5,400	1,100	4,800	12,600	2,100	15,100	2,100
White	40,400	5,100	1,000	4,500	11,700	1,900	14,200	2,000
Black	800	100	(2)	100	300	100	200	(2)
Asian	600	100	(2)	(2)	200	(2)	100	(2)
Native American	500	(2)	(2)	(2)	100	(2)	200	(2)
Social scientists	52,900	7,600	2,300	6,000	29,300	1,400	1,100	5,400
White	47,400	7,000	2,000	5,500	25,800	1,300	1,000	4,800
Black	1,300	100	100	300	600	(2)	100	100
Asian	2,800	300	100	100	[illegible]	(2)	100	300
Native American	400	(2)	(2)	(2)	[illegible]	(2)	(2)	(2)
Engineers	57,000	23,400	10,300	4,900	10,700	3,800	700	3,100
White	46,600	17,400	8,800	4,600	9,500	2,900	600	2,700
Black	300	100	100	(2)	(2)	(2)	(2)	(2)
Asian	8,900	5,300	1,200	200	900	800	100	400
Native American	400	200	(2)	100	100	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332) and unpublished data.

Appendix table 20 - Women doctoral scientists and engineers by field, race, and primary work activity: 1981

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Consulting	Professional services to indiv.	Other and no report
Total S/E[1]	40,900	12,300	1,500	3,500	13,900	1,100	5,600	3,000
White	36,300	10,400	1,300	3,200	12,500	900	5,300	2,700
Black	1,000	200	100	200	400	100	100	100
Asian	2,800	1,500	200	100	700	100	100	200
Native American	300	100	(2)	(2)	100	(2)	100	(2)
Total scientists	40,200	11,900	1,400	3,500	13,800	1,000	5,600	2,900
White	35,700	10,200	1,200	3,100	12,400	900	5,300	2,600
Black	1,000	200	100	200	400	100	100	100
Asian	2,700	1,400	200	100	700	100	100	200
Native American	300	100	(2)	(2)	100	(2)	100	(2)
Physical scientists	3,800	1,800	200	200	1,100	(2)	100	300
White	3,000	1,300	200	200	1,000	(2)	100	300
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	600	400	100	(2)	100	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical scientists	1,300	200	(2)	(2)	900	100	(2)	(2)
White	1,100	200	(2)	(2)	800	(2)	(2)	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	200	(2)	(2)	(2)	100	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	700	400	(2)	(2)	100	(2)	(2)	100
White	600	300	(2)	(2)	100	(2)	(2)	100
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	900	400	100	100	200	100	(2)	100
White	800	300	100	100	200	100	(2)	100
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	13,200	6,600	500	900	3,600	200	600	900
White	11,500	5,600	400	800	3,200	100	500	800
Black	300	100	(2)	100	100	(2)	(2)	(2)
Asian	1,200	800	100	(2)	200	(2)	100	100
Native American	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Appendix table 20 - (cont.)

Field and race	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Consulting	Professional services to indiv.	Other and no report
Psychologists	11,900	1,200	200	1,300	3,300	500	4,700	700
White	11,000	1,100	200	1,100	3,000	400	4,400	700
Black	400	(2)	(2)	100	100	(2)	100	(2)
Asian	200	(2)	(2)	(2)	100	(2)	(2)	(2)
Native American	100	(2)	(2)	(2)	(2)	(2)	100	(2)
Social scientists	8,400	1,400	400	1,000	4,600	200	200	700
White	7,700	1,300	300	900	4,200	200	200	700
Black	300	(2)	(2)	(2)	100	(2)	(2)	(2)
Asian	300	100	(2)	(2)	100	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Engineers	800	400	100	(2)	100	100	(2)	100
White	600	300	100	(2)	100	100	(2)	100
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 21 - Hispanic doctoral scientists and engineers by field, sex, and primary work activity: 1981

Field and sex	Total employed	Research and development	Management of R&D	Management of other than R&D	Teaching	Consulting	Professional services to indiv.	Other and no report
Total S/E	4,800	1,800	400	400	1,200	300	400	200
Men	4,200	1,700	300	400	1,000	300	300	200
Women	600	100	(1)	100	200	(1)	100	(1)
Total scientists	4,100	1,600	300	300	1,100	200	400	200
Men	3,500	1,400	300	300	900	200	300	200
Women	600	100	(1)	100	200	(1)	100	(1)
Physical scientists	900	300	100	(1)	300	(1)	(1)	100
Men	800	300	100	(1)	300	(1)	(1)	100
Women	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mathematical scientists	200	100	(1)	(1)	100	(1)	(1)	(1)
Men	200	100	(1)	(1)	100	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Computer specialists	100	(1)	(1)	100	(1)	(1)	(1)	(1)
Men	100	(1)	(1)	100	(1)	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Environmental scientists	100	100	(1)	(1)	(1)	(1)	(1)	(1)
Men	100	100	(1)	(1)	(1)	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Life scientists	1,200	600	100	(1)	300	(1)	100	100
Men	1,000	500	100	(1)	200	(1)	100	(1)
Women	200	(1)	(1)	(1)	100	(1)	(1)	(1)
Psychologists	600	100	(1)	100	100	100	200	(1)
Men	500	100	(1)	100	100	100	200	(1)
Women	100	(1)	(1)	(1)	(1)	(1)	100	(1)
Social scientists	900	300	(1)	100	300	100	(1)	(1)
Men	700	300	(1)	(1)	200	100	(1)	(1)
Women	200	(1)	(1)	(1)	100	(1)	(1)	(1)
Engineers	700	300	100	100	100	200	(1)	(1)
Men	700	300	100	100	100	200	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 22 - Scientists and engineers by field, sex, and type of employer: 1982

Field and sex	*Total employed*	*Business/ industry*	*Educational institutions*	*Nonprofit organizations*	*Federal Government*	*State/ local governments*	*Other*	*No report*
Total S/E	3,328,500	2,063,600	389,700	71,300	285,000	172,700	243,200	103,100
Men	2,891,300	1,853,700	293,000	52,200	248,100	147,500	202,600	94,200
Women	437,100	209,900	96,700	19,100	36,900	25,200	40,600	8,800
Total scientists	1,488,900	679,800	339,400	50,700	154,800	89,100	140,100	35,000
Men	1,116,200	521,600	243,400	32,100	121,900	60,100	101,000	28,100
Women	372,700	158,200	94,000	18,600	32,900	23,000	39,100	6,800
Physical scientists	225,100	129,100	46,900	7,100	22,500	6,300	7,800	5,500
Men	198,800	114,300	41,400	6,300	20,400	4,900	6,600	5,000
Women	26,300	14,800	5,500	800	2,100	1,400	1,300	500
Mathematical scientists	44,600	8,800	26,200	1,500	4,500	1,800	1,300	600
Men	24,200	4,200	16,400	400	2,000	400	400	400
Women	20,400	4,700	9,800	1,000	2,500	1,400	900	100
Computer specialists	382,200	285,900	20,100	7,100	27,600	14,500	19,200	8,000
Men	278,100	210,200	14,100	4,600	18,300	10,200	14,000	6,700
Women	104,100	75,700	6,000	2,500	9,200	4,300	5,200	1,300
Environmental scientists	85,700	44,600	10,400	800	13,800	3,900	9,800	2,300
Men	75,400	39,000	9,000	600	12,000	3,300	9,300	2,200
Women	10,400	5,600	1,400	300	1,800	600	500	100
Life scientists	350,900	96,500	113,600	10,500	58,700	34,300	30,000	7,400
Men	273,600	74,300	84,000	7,300	49,500	29,300	23,100	6,100
Women	77,300	22,200	29,600	3,200	9,200	4,900	6,900	1,300
Psychologists	144,200	26,100	52,900	8,700	3,300	7,900	40,100	5,300
Men	85,300	14,700	31,200	4,800	2,200	5,100	23,900	3,400
Women	59,000	11,300	21,800	3,800	1,100	2,900	16,200	1,900
Social scientists	256,000	88,800	69,400	15,100	24,500	20,400	31,900	5,900
Men	180,800	65,000	49,400	8,100	17,500	12,900	23,700	4,300
Women	75,200	23,800	20,000	7,000	7,000	7,500	8,200	1,600
Engineers	1,839,600	1,383,800	50,300	20,600	130,200	83,500	103,100	68,100
Men	1,775,100	1,332,100	47,600	20,100	126,300	81,400	101,600	66,100
Women	64,500	51,700	2,700	500	3,900	2,100	1,400	2,000

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 23 - Scientists and engineers by field, race, and type of employer: 1982

Field and race	*Total employed*	*Business/ industry*	*Educational institutions*	*Nonprofit organizations*	*Federal Government*	*State/ local governments*	*Other*	*No report*
Total S/E[1]	3,328,500	2,063,600	389,700	71,300	285,000	172,700	243,200	103,100
White	3,040,000	1,893,400	355,100	64,700	255,300	153,600	223,500	94,400
Black	86,400	45,500	10,800	2,500	14,300	5,300	4,400	3,700
Asian	149,900	95,100	17,100	3,300	10,700	9,500	10,200	3,800
Native American	13,500	7,200	1,500	400	1,000	700	2,300	400
Total scientists	1,488,900	679,800	339,400	50,700	154,800	89,100	140,100	35,000
White	1,364,700	628,800	311,900	46,000	138,700	80,300	126,900	32,100
Black	46,200	16,300	9,500	2,100	9,700	3,400	3,500	1,700
Asian	54,800	25,100	12,700	2,000	4,200	3,100	6,700	900
Native American	5,700	1,900	1,200	200	600	500	1,200	(2)
Physical scientists	225,100	129,100	46,900	7,100	22,500	6,300	7,800	5,500
White	207,400	118,900	44,000	6,800	20,800	5,500	6,900	4,600
Black	5,700	3,100	700	100	700	300	300	500
Asian	9,200	5,600	1,600	200	600	300	600	400
Native American	500	300	100	(2)	100	(2)	(2)	(2)
Mathematical scientists	44,600	8,800	26,200	1,500	4,500	1,800	1,300	600
White	33,900	6,300	21,400	800	3,400	700	800	600
Black	2,700	300	1,500	200	700	(2)	(2)	(2)
Asian	6,900	1,900	2,800	500	300	800	500	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	382,200	285,900	20,100	7,100	27,600	14,500	19,200	8,000
White	353,600	266,200	18,100	6,500	24,200	13,600	17,400	7,600
Black	9,500	6,200	500	100	2,000	200	200	100
Asian	14,200	10,200	900	500	800	500	1,200	200
Native American	1,200	600	200	(2)	200	(2)	100	(2)
Environmental scientists	85,700	44,600	10,400	800	13,800	3,900	9,800	2,300
White	79,700	41,100	9,500	800	12,700	3,900	9,500	2,200
Black	500	200	(2)	(2)	300	(2)	(2)	(2)
Asian	3,600	2,300	600	(2)	600	(2)	100	100
Native American	700	400	100	(2)	100	(2)	100	(2)
Life scientists	350,900	96,500	113,600	10,500	58,700	34,300	30,000	7,400
White	331,000	92,700	107,100	10,100	53,900	32,700	27,300	7,100
Black	8,100	900	1,900	(2)	3,400	600	1,000	200
Asian	8,000	2,100	3,100	400	800	600	900	100
Native American	1,100	200	400	(2)	100	100	300	(2)

Appendix table 23 - (cont.)

Field and race	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/ local governments	Other	No report
Psychologists	144,200	26,100	52,900	8,700	3,300	7,900	40,100	5,300
White	135,800	24,000	50,000	8,000	3,100	7,200	38,300	5,200
Black	4,800	1,500	1,800	300	100	400	700	100
Asian	1,400	200	500	(2)	(2)	200	300	(2)
Native American	900	200	100	200	(2)	100	400	(2)
Social scientists	256,000	88,800	69,400	15,100	24,500	20,400	31,900	5,900
White	223,400	79,700	61,900	13,000	20,600	15,700	26,700	4,900
Black	14,900	4,100	3,100	1,400	2,400	1,900	1,200	800
Asian	11,400	2,900	3,100	400	1,000	700	3,100	100
Native American	1,200	200	300	100	100	300	400	(2)
Engineers	1,839,600	1,383,800	50,300	20,600	130,200	83,500	103,100	68,100
White	1,675,300	1,264,600	43,200	18,700	116,600	73,200	96,700	62,300
Black	40,200	29,200	1,300	400	4,600	1,900	900	1,900
Asian	95,100	70,000	4,400	1,300	6,500	6,500	3,500	2,900
Native American	7,900	5,300	300	100	500	200	1,100	400

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 24 - Women scientists and engineers by field, race, and type of employer: 1982

Field and race	*Total employed*	*Business/ industry*	*Educational institutions*	*Nonprofit organizations*	*Federal Government*	*State/ local governments*	*Other*	*No report*
Total S/E[1]	437,100	209,900	96,700	19,100	36,900	25,200	40,600	8,800
White	372,900	177,500	86,500	15,900	29,500	20,700	35,700	7,000
Black	29,600	14,500	4,500	1,500	4,700	1,500	1,400	1,500
Asian	26,200	13,700	4,300	1,300	1,800	1,800	2,900	400
Native American	1,700	800	300	200	(2)	200	100	(2)
Total scientists	372,700	158,200	94,000	18,600	32,900	23,000	39,100	6,800
White	323,900	138,100	84,700	15,400	26,800	18,900	34,300	5,700
Black	22,000	8,500	4,000	1,500	4,100	1,500	1,400	900
Asian	20,300	9,000	4,000	1,300	1,300	1,600	2,900	200
Native American	1,300	400	300	200	(2)	200	100	(2)
Physical scientists	26,300	14,800	5,500	800	2,100	1,400	1,300	500
White	21,300	11,400	5,100	700	1,700	1,200	1,000	200
Black	2,900	1,800	100	100	300	100	200	300
Asian	2,000	1,500	200	(2)	100	100	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical scientists	20,400	4,700	9,800	1,000	2,500	1,400	900	100
White	12,200	2,400	6,900	400	1,600	400	400	100
Black	2,100	200	1,000	200	700	(2)	(2)	(2)
Asian	5,300	1,700	1,600	500	200	800	500	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	104,100	75,700	6,000	2,500	9,200	4,300	5,200	1,300
White	92,300	67,700	5,500	2,200	7,100	4,100	4,500	1,100
Black	5,100	3,300	300	100	1,300	(2)	100	(2)
Asian	5,500	3,800	100	200	600	200	400	100
Native American	200	200	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	10,400	5,600	1,400	300	1,800	600	500	100
White	10,200	5,500	1,400	300	1,800	600	500	100
Black	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	77,300	22,200	29,600	3,200	9,200	4,900	6,900	1,300
White	72,200	20,800	27,800	3,000	8,800	4,600	6,100	1,300
Black	1,500	300	500	(2)	300	(2)	400	100
Asian	2,100	700	800	200	100	200	200	(2)
Native American	400	100	100	(2)	(2)	(2)	100	(2)

Appendix table 24 - (cont.)

Field and race	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/ local governments	Other	No report
Psychologists	59,000	11,300	21,800	3,800	1,100	2,900	16,200	1,900
White	54,800	10,200	20,200	3,300	1,000	2,600	15,700	1,800
Black	2,500	800	1,000	200	(2)	200	200	(2)
Asian	900	100	400	(2)	(2)	(2)	200	(2)
Native American	300	(2)	100	200	(2)	(2)	(2)	(2)
Social scientists	75,200	23,800	20,000	7,000	7,000	7,500	8,200	1,600
White	60,900	20,100	17,800	5,600	4,800	5,500	6,100	1,000
Black	7,800	2,000	1,100	1,000	1,600	1,200	400	500
Asian	4,400	1,100	800	400	400	300	1,500	(2)
Native American	400	100	100	(2)	(2)	200	(2)	(2)
Engineers	64,500	51,700	2,700	500	3,900	2,100	1,400	2,000
White	48,900	39,400	1,900	500	2,800	1,700	1,300	1,300
Black	7,600	6,000	500	(2)	600	(2)	(2)	500
Asian	5,900	4,600	300	(2)	500	300	100	200
Native American	400	400	(2)	(2)	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 25 - Hispanic scientists and engineers by field, sex, and type of employer: 1982

Field and sex	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/ local governments	Other	No report
Total S/E	74,200	42,600	7,700	1,100	6,000	7,700	6,500	2,400
Men	62,600	37,600	5,600	700	4,900	6,100	5,500	2,300
Women	11,500	5,100	2,100	400	1,200	1,600	1,000	100
Total scientists	30,700	12,400	6,500	700	2,800	4,100	3,400	900
Men	21,200	8,800	4,300	200	2,000	2,700	2,400	800
Women	9,500	3,600	2,100	400	900	1,400	1,000	100
Physical scientists	3,800	2,000	800	(1)	300	200	300	200
Men	3,000	1,400	600	(1)	200	200	300	200
Women	800	600	100	(1)	(1)	(1)	(1)	(1)
Mathematical scientists	1,200	100	500	(1)	(1)	400	(1)	100
Men	400	(1)	200	(1)	(1)	(1)	(1)	100
Women	700	100	300	(1)	(1)	400	(1)	(1)
Computer specialists	5,900	4,300	100	(1)	400	600	300	300
Men	4,400	3,200	100	(1)	(1)	600	100	300
Women	1,500	1,000	(1)	(1)	400	(1)	100	(1)
Environmental scientists	1,500	800	100	100	200	100	100	100
Men	1,400	800	100	(1)	200	100	100	100
Women	200	100	(1)	100	(1)	(1)	(1)	(1)
Life scientists	6,700	2,000	2,100	(1)	800	700	1,000	100
Men	4,700	1,400	1,400	(1)	800	400	700	100
Women	2,000	600	800	(1)	(1)	300	300	100
Psychologists	2,700	700	800	200	100	200	700	(1)
Men	1,200	300	300	(1)	100	100	500	(1)
Women	1,500	400	500	100	(1)	200	200	(1)
Social scientists	8,900	2,400	2,000	400	900	1,900	1,000	100
Men	6,100	1,600	1,500	200	600	1,300	700	100
Women	2,800	800	500	300	400	600	300	(1)
Engineers	43,500	30,200	1,300	500	3,200	3,700	3,100	1,500
Men	41,500	28,800	1,300	500	2,900	3,400	3,100	1,500
Women	2,000	1,400	(1)	(1)	300	200	(1)	(1)

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 26 - Doctoral scientists and engineers by field, sex, and type of employer: 1981

Field and sex	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/local governments	Other	No report
Total S/E	343,500	99,000	186,300	12,600	25,100	6,500	12,900	600
Men	302,600	91,800	161,000	10,500	23,100	5,200	10,500	500
Women	40,900	7,200	25,800	2,100	2,000	1,400	2,400	100
Total scientists	286,600	67,400	168,700	10,200	21,300	6,200	12,200	600
Men	246,400	60,600	143,200	8,200	19,300	4,800	9,900	500
Women	40,200	6,800	25,600	2,100	1,900	1,300	2,400	100
Physical scientists	63,200	27,400	28,300	2,100	4,300	400	700	(1)
Men	59,400	26,300	26,300	1,900	4,100	300	600	(1)
Women	3,800	1,100	2,100	200	200	100	100	(1)
Mathematical scientists	15,600	1,600	12,700	300	900	(1)	100	(1)
Men	14,300	1,500	11,700	200	800	(1)	100	(1)
Women	1,300	100	1,100	(1)	100	(1)	(1)	(1)
Computer specialists	9,000	5,200	3,000	300	400	200	(1)	(1)
Men	8,300	4,800	2,800	300	300	100	(1)	(1)
Women	700	400	300	(1)	(1)	(1)	(1)	(1)
Environmental scientists	16,000	4,800	6,800	600	3,100	600	100	(1)
Men	15,200	4,600	6,400	600	2,900	600	100	(1)
Women	900	200	400	(1)	100	(1)	(1)	(1)
Life scientists	86,700	13,500	56,800	3,200	7,600	1,600	3,900	200
Men	73,500	12,200	47,300	2,500	6,800	1,300	3,300	100
Women	13,200	1,300	9,500	700	800	300	600	(1)
Psychologists	43,100	10,100	21,800	1,700	1,200	1,700	6,400	(1)
Men	31,200	7,100	15,800	1,200	1,000	1,100	4,900	(1)
Women	11,900	3,000	6,000	500	200	600	1,600	(1)
Social scientists	52,900	4,700	39,300	2,200	3,900	1,700	1,000	300
Men	44,500	4,100	33,000	1,600	3,300	1,400	900	200
Women	8,400	600	6,300	600	500	300	100	(1)
Engineers	57,000	31,700	18,100	2,300	3,800	00	700	(1)
Men	56,200	31,200	17,900	2,300	3,800	400	700	(1)
Women	800	400	200	(1)	(1)	(1)	(1)	(1)

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332).

Appendix table 27 - Doctoral scientists and engineers by field, race, and type of employer: 1981

Field and race	*Total employed*	*Business/ industry*	*Educational institutions*	*Nonprofit organizations*	*Federal Government*	*State/local governments*	*Other*	*No report*
Total S/E[1]	343,500	99,000	186,800	12,600	25,100	6,500	12,900	600
White	304,400	84,700	167,100	11,400	23,000	6,000	11,700	500
Black	4,300	600	2,900	200	300	100	200	(2)
Asian	26,900	11,800	12,000	800	1,300	300	600	(2)
Native American	2,200	600	1,200	100	200	(2)	100	(2)
Total scientists	286,600	67,400	168,700	10,200	21,300	6,200	12,200	600
White	257,800	60,200	151,400	9,300	19,600	5,800	11,100	500
Black	4,100	500	2,600	200	200	100	200	(2)
Asian	18,000	5,300	10,300	500	1,000	200	600	(2)
Native American	1,800	400	1,100	100	200	(2)	100	(2)
Physical scientists	63,200	27,400	28,300	2,100	4,300	400	700	(2)
White	55,500	23,900	25,100	1,800	3,800	300	600	(2)
Black	600	200	300	(2)	(2)	(2)	(2)	(2)
Asian	5,700	2,800	2,100	200	400	100	100	(2)
Native American	300	100	200	(2)	(2)	(2)	(2)	(2)
Mathematical scientists	15,600	1,600	12,700	300	900	(2)	100	(2)
White	13,700	1,500	11,200	200	700	(2)	(2)	(2)
Black	200	(2)	100	(2)	(2)	(2)	(2)	(2)
Asian	1,200	100	1,000	(2)	(2)	(2)	(2)	(2)
Native American	100	(2)	100	(2)	(2)	(2)	(2)	(2)
Computer specialists	9,000	5,200	3,000	300	400	200	(2)	(2)
White	7,900	4,500	2,700	300	300	200	(2)	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	900	600	300	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	16,000	4,800	6,800	600	3,100	600	100	(2)
White	15,000	4,500	6,300	500	2,900	600	100	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	700	200	300	100	100	(2)	(2)	(2)
Native American	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	86,700	13,500	56,800	3,200	7,600	1,600	3,900	200
White	77,900	12,000	50,800	2,800	7,100	1,600	3,400	100
Black	1,100	100	800	(2)	100	(2)	100	(2)
Asian	6,100	1,100	4,100	200	300	100	400	(2)
Native American	500	100	300	(2)	(2)	(2)	(2)	(2)

Appendix table 27 - (cont.)

Field and race	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/local governments	Other	No report
Psychologists	43,100	10,100	21,800	1,700	1,200	1,700	6,400	(2)
White	40,400	9,600	20,300	1,600	1,100	1,600	6,100	(2)
Black	800	100	500	(2)	(2)	(2)	100	(2)
Asian	600	100	300	(2)	(2)	(2)	100	(2)
Native American	500	200	200	(2)	(2)	(2)	100	(2)
Social scientists	52,900	4,700	39,300	2,200	3,900	1,700	1,000	300
White	47,400	4,200	35,000	2,000	3,600	1,500	900	300
Black	1,300	100	1,000	100	100	100	(2)	(2)
Asian	2,800	300	2,200	(2)	100	100	100	(2)
Native American	400	(2)	300	(2)	(2)	(2)	(2)	(2)
Engineers	57,000	31,700	18,100	2,300	3,800	400	700	(2)
White	46,600	24,500	15,700	2,100	3,400	300	600	(2)
Black	300	100	100	(2)	(2)	(2)	(2)	(2)
Asian	8,900	6,400	1,800	200	300	100	(2)	(2)
Native American	400	200	100	(2)	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332).

Appendix table 28 - Women doctoral scientists and engineers by field, race, and type of employer: 1981

Field and race	*Total employed*	*Business/ industry*	*Educational institutions*	*Nonprofit organizations*	*Federal Government*	*State/local governments*	*Other*	*No report*
Total S/E[1]	40,900	7,200	25,800	2,100	2,000	1,400	2,400	100
White	36,300	6,300	23,000	1,900	1,800	1,200	2,100	100
Black	1,000	100	700	100	100	(2)	100	(2)
Asian	2,800	700	1,700	100	100	100	100	(2)
Native American	300	100	100	(2)	(2)	(2)	100	(2)
Total scientists	40,200	6,800	25,600	2,100	1,900	1,300	2,400	100
White	35,700	6,000	22,800	1,900	1,700	1,200	2,100	100
Black	1,000	100	700	100	100	(2)	100	(2)
Asian	2,700	600	1,600	100	100	100	100	(2)
Native American	300	100	100	(2)	(2)	(2)	100	(2)
Physical scientists	3,800	1,100	2,100	200	200	100	100	(2)
White	3,000	800	1,700	200	200	(2)	100	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	600	300	300	(2)	(2)	100	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical scientists	1,300	100	1,100	(2)	100	(2)	(2)	(2)
White	1,100	100	900	(2)	(2)	(2)	(2)	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	200	(2)	100	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	700	400	300	(2)	(2)	(2)	(2)	(2)
White	600	300	200	(2)	(2)	(2)	(2)	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	900	200	400	(2)	100	(2)	(2)	(2)
White	800	200	300	(2)	100	(2)	(2)	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	13,200	1,300	9,500	700	800	300	600	(2)
White	11,500	1,100	8,300	600	700	300	500	(2)
Black	300	(2)	200	(2)	(2)	(2)	(2)	(2)
Asian	1,200	200	900	(2)	100	(2)	100	(2)
Native American	100	(2)	100	(2)	(2)	(2)	(2)	(2)

Appendix table 28 - (cont.)

Field and race	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/local governments	Other	No report
Psychologists	11,900	3,000	6,000	500	200	600	1,600	(2)
White	11,000	2,800	5,500	500	200	500	1,400	(2)
Black	400	100	200	(2)	(2)	(2)	100	(2)
Asian	200	(2)	100	(2)	(2)	(2)	(2)	(2)
Native American	100	(2)	(2)	(2)	(2)	(2)	100	(2)
Social scientists	8,400	600	6,300	600	500	300	100	(2)
White	7,700	600	5,800	500	500	300	100	(2)
Black	300	(2)	200	(2)	(2)	(2)	(2)	(2)
Asian	300	(2)	200	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Engineers	800	400	200	(2)	(2)	(2)	(2)	(2)
White	600	300	200	(2)	(2)	(2)	(2)	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	100	100	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 29 - Hispanic doctoral scientists and engineers by field, sex, and type of employer: 1981

Field and sex	Total employed	Business/ industry	Educational institutions	Nonprofit organizations	Federal Government	State/local governments	Other	No report
Total S/E	4,800	1,200	2,500	200	400	100	200	(1)
Men	4,200	1,200	2,200	200	400	100	200	(1)
Women	600	100	400	(1)	(1)	(1)	(1)	(1)
Total scientists	4,100	800	2,400	200	400	100	200	(1)
Men	3,500	700	2,000	100	400	100	200	(1)
Women	600	100	400	(1)	(1)	(1)	(1)	(1)
Physical scientists	900	300	400	(1)	100	(1)	(1)	(1)
Men	800	300	400	(1)	100	(1)	(1)	(1)
Women	100	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Mathematical scientists	200	(1)	200	(1)	(1)	(1)	(1)	(1)
Men	200	(1)	200	(1)	(1)	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Computer specialists	100	100	100	(1)	(1)	(1)	(1)	(1)
Men	100	100	100	(1)	(1)	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Environmental scientists	100	(1)	100	(1)	100	(1)	(1)	(1)
Men	100	(1)	100	(1)	100	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Life scientists	1,200	200	700	100	100	(1)	100	(1)
Men	1,000	200	600	(1)	100	(1)	(1)	(1)
Women	200	(1)	100	(1)	(1)	(1)	(1)	(1)
Psychologists	600	200	300	100	(1)	100	100	(1)
Men	500	100	200	(1)	(1)	(1)	100	(1)
Women	100	(1)	100	(1)	(1)	(1)	(1)	(1)
Social scientists	900	100	600	(1)	(1)	100	100	(1)
Men	700	100	500	(1)	(1)	100	100	(1)
Women	200	(1)	100	(1)	(1)	(1)	(1)	(1)
Engineers	700	400	100	(1)	100	(1)	(1)	(1)
Men	700	400	100	(1)	100	(1)	(1)	(1)
Women	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 30 - Scientists and engineers by field, race, sex, and full-time/part-time status: 1982

Field and race	*Total employed*[1]			*[illegible]-time employed*			*Part-time employed*		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*	*Total*	*Men*	*Women*
Total S/E[2]	3,328,500	2,891,300	437,100	3,179,300	2,800,800	378,500	138,100	84,800	53,200
White	3,040,000	2,667,200	372,900	2,902,800	2,583,100	319,700	127,100	78,700	48,500
Black	86,400	56,800	29,600	83,000	55,400	27,600	2,700	1,300	1,400
Asian	149,900	123,700	26,200	144,200	120,500	23,700	5,400	2,900	2,500
Native American	13,500	11,800	1,700	13,000	11,500	1,600	500	300	200
Total scientists	1,488,900	1,116,200	372,700	1,380,900	1,063,600	317,300	100,600	49,800	50,800
White	1,364,700	1,040,800	323,900	1,265,000	991,500	273,500	93,000	46,600	46,400
Black	46,200	24,200	22,000	43,600	23,400	20,200	2,000	800	1,300
Asian	54,800	34,500	20,300	51,200	33,100	18,100	3,500	1,300	2,200
Native American	5,700	4,300	1,300	5,400	4,200	1,200	200	100	200
Physical scientists	225,100	198,800	26,300	212,600	189,700	22,900	11,400	8,400	3,000
White	207,400	186,100	21,300	195,700	177,400	18,200	10,900	8,000	2,800
Black	5,700	2,800	2,900	5,500	2,800	2,700	100	(3)	100
Asian	9,200	7,300	2,000	8,900	7,000	1,900	300	200	100
Native American	500	500	(3)	500	500	(3)	(3)	(3)	(3)
Mathematical scientists	44,600	24,200	20,400	39,200	21,900	17,300	4,900	2,100	2,800
White	33,900	21,700	12,200	29,400	19,700	9,700	3,800	1,700	2,100
Black	2,700	600	2,100	2,600	600	2,000	100	(3)	100
Asian	6,900	1,600	5,300	6,000	1,300	4,700	900	300	600
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	382,200	278,100	104,100	370,800	274,700	96,100	9,900	3,000	6,900
White	353,600	261,200	92,300	342,600	258,200	84,500	9,400	2,700	6,700
Black	9,500	4,300	5,100	9,400	4,300	5,100	(3)	(3)	(3)
Asian	14,200	8,800	5,500	14,000	8,600	5,400	200	100	100
Native American	1,200	900	200	1,200	900	200	(3)	(3)	(3)
Environmental scientists	85,700	75,400	10,400	79,700	71,100	8,600	5,800	4,100	1,700
White	79,700	69,500	10,200	73,800	65,400	8,400	5,600	3,900	1,700
Black	500	500	100	500	400	(3)	(3)	(3)	(3)
Asian	3,600	3,500	100	3,500	3,400	100	100	100	(3)
Native American	700	700	(3)	700	700	(3)	(3)	(3)	(3)
Life scientists	350,900	273,600	77,300	322,600	257,600	65,100	27,000	15,700	11,300
White	331,000	258,800	72,200	304,300	243,400	60,900	25,400	14,900	10,500
Black	8,100	6,600	1,500	7,600	6,400	1,200	500	100	300
Asian	8,000	5,800	2,100	7,600	5,600	1,900	400	200	200
Native American	1,100	700	400	1,100	700	400	(3)	(3)	(3)

Appendix table 30 - (cont.)

Field and race	*Total employed*			*Full-time employed*			*Part-time employed*		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*	*Total*	*Men*	*Women*
Psychologists	144,200	85,300	59,000	123,900	79,300	44,600	19,300	5,600	13,700
White	135,800	81,000	54,800	116,900	75,400	41,500	17,900	5,200	12,700
Black	4,800	2,300	2,500	4,200	2,100	2,100	600	200	400
Asian	1,400	500	900	1,000	500	500	400	(3)	400
Native American	900	700	300	800	700	100	200	(3)	200
Social scientists	256,000	180,800	75,200	232,100	169,300	62,800	22,300	11,000	11,300
White	223,400	162,500	60,900	202,200	151,900	50,300	20,000	10,100	10,000
Black	14,900	7,100	7,800	13,800	6,700	7,100	700	400	300
Asian	11,400	7,000	4,400	10,200	6,600	3,600	1,200	400	900
Native American	1,200	800	400	1,200	800	400	100	100	(3)
Engineers	1,839,600	1,775,100	64,500	1,798,400	1,737,200	61,200	37,500	35,000	2,500
White	1,675,300	1,626,400	48,900	1,637,800	1,591,600	46,200	34,100	32,100	2,000
Black	40,200	32,600	7,600	39,400	32,000	7,400	700	500	100
Asian	95,100	89,200	5,900	93,000	87,400	5,600	1,900	1,600	300
Native American	7,900	7,500	400	7,600	7,200	400	200	200	(3)

[1] Includes employed categories listed as well as No report.

[2] Includes racial categories listed as well as Other and No report.

[3] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 31 - Doctoral scientists and engineers by field, race, sex, and full-time/part-time status: 1981

Field and Race	Total Employed			Full-time employed			Part-time employed		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E[1]	343,500	302,600	40,900	332,500	296,300	36,300	11,000	6,300	4,700
White	304,400	268,100	36,300	294,000	262,100	31,900	10,400	6,000	4,400
Black	4,300	3,300	1,000	4,200	3,200	1,000	100	100	(2)
Asian	26,900	24,100	2,800	26,600	23,900	2,600	300	100	200
Native American	2,200	1,900	300	2,100	1,800	300	100	100	(2)
Total scientists	286,600	246,400	40,200	276,400	240,900	35,600	10,200	5,500	4,600
White	257,800	222,100	35,700	248,300	216,900	31,400	9,600	5,300	4,300
Black	4,100	3,000	1,000	4,000	3,000	1,000	100	100	(2)
Asian	18,000	15,300	2,700	17,700	15,200	2,500	300	100	200
Native American	1,800	1,500	300	1,800	1,500	300	100	(2)	(2)
Physical scientists	63,200	59,400	3,800	61,600	58,200	3,400	1,600	1,200	400
White	55,500	52,500	3,000	54,000	51,400	2,700	1,500	1,100	400
Black	600	600	(2)	600	500	(2)	(2)	(2)	(2)
Asian	5,700	5,100	600	5,600	5,000	600	100	(2)	(2)
Native American	300	300	(2)	300	300	(2)	(2)	(2)	(2)
Mathematical scientists	15,600	14,300	1,300	15,200	14,000	1,200	400	200	100
White	13,700	12,600	1,100	13,400	12,400	1,000	300	200	100
Black	200	200	(2)	200	200	(2)	(2)	(2)	(2)
Asian	1,200	1,000	200	1,200	1,000	200	(2)	(2)	(2)
Native American	100	100	(2)	100	100	(2)	(2)	(2)	(2)
Computer specialists	9,000	8,300	700	8,700	8,100	600	400	300	100
White	7,900	7,300	600	7,600	7,100	500	400	300	100
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	900	800	100	900	800	100	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	16,000	15,200	900	15,500	14,700	800	500	500	100
White	15,000	14,200	800	14,500	13,800	700	500	400	100
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	700	700	(2)	700	700	(2)	(2)	(2)	(2)
Native American	100	100	(2)	100	100	(2)	(2)	(2)	(2)
Life scientists	86,700	73,500	13,200	84,300	72,200	12,100	2,400	1,300	1,100
White	77,900	66,400	11,500	75,600	65,100	10,500	2,300	1,200	1,000
Black	1,100	800	300	1,100	800	300	(2)	(2)	(2)
Asian	6,100	4,800	1,200	6,000	4,800	1,200	100	100	100
Native American	500	400	100	500	400	100	(2)	(2)	(2)

Appendix table 31 - (cont.)

	Total Employed			Full-time employed			Part-time employed		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*	*Total*	*Men*	*Women*
Psychologists	43,100	31,200	11,900	39,900	30,100	9,800	3,100	1,100	2,000
White	40,400	29,400	11,000	37,400	28,400	9,000	3,000	1,000	1,900
Black	800	400	400	800	400	300	(2)	(2)	(2)
Asian	600	300	200	500	300	200	(2)	(2)	(2)
Native American	500	300	100	500	300	100	(2)	(2)	(2)
Social scientists	52,900	44,500	8,400	51,200	43,600	7,700	1,700	1,000	800
White	47,400	39,700	7,700	45,800	38,900	7,000	1,600	900	700
Black	1,300	1,000	300	1,300	1,000	300	(2)	(2)	(2)
Asian	2,800	2,600	300	2,800	2,500	300	(2)	(2)	(2)
Native American	400	300	(2)	400	300	(2)	(2)	(2)	(2)
Engineers	57,000	56,200	800	56,100	55,400	700	800	800	100
White	46,500	45,900	600	45,800	45,200	600	800	700	(2)
Black	300	300	(2)	300	300	(2)	(2)	(2)	(2)
Asian	8,900	8,800	100	8,900	8,800	100	(2)	(2)	(2)
Native American	400	400	(2)	300	300	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States: 1981* (NSF 82-332) and unpublished data.

Appendix table 32 - Employed scientists and engineers by field, sex, and years of professional experience: 1982

Field and sex	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	3,328,500	225,800	512,600	573,900	531,000	386,500	351,100	265,900	296,800	166,300
Men	2,891,300	193,700	381,600	461,400	454,200	350,100	330,500	253,400	289,300	159,800
Women	437,100	32,100	131,000	112,500	76,800	36,400	20,600	12,400	7,500	6,500
Total scientists	1,488,900	101,300	271,900	311,100	267,100	171,700	133,500	95,000	85,200	44,700
Men	1,116,200	73,000	170,000	214,400	198,000	138,200	114,600	83,800	78,900	39,000
Women	372,700	28,300	101,900	96,700	69,100	33,500	18,900	11,200	6,300	5,700
Physical scientists	225,100	12,000	29,600	34,000	33,600	29,500	28,700	18,900	24,900	12,500
Men	198,800	10,500	22,300	28,500	29,600	26,900	26,900	17,400	23,700	11,700
Women	26,300	1,400	7,300	5,500	4,000	2,700	1,800	1,500	1,200	800
Mathematical scientists	44,600	2,200	5,000	9,800	8,400	6,700	6,000	3,000	1,700	1,800
Men	24,200	1,400	2,100	4,500	4,400	3,600	3,600	1,700	1,500	1,200
Women	20,400	800	2,900	5,300	4,000	3,100	2,400	1,200	200	600
Computer specialists	382,200	19,100	66,900	95,100	86,500	52,000	32,400	18,000	8,500	3,100
Men	278,100	15,000	42,600	63,500	60,700	40,700	28,300	16,400	7,400	3,000
Women	104,100	4,100	24,400	31,600	25,800	11,300	4,200	1,600	1,100	100
Environmental scientists	85,700	5,400	18,800	18,200	10,100	5,700	6,900	7,600	9,700	2,700
Men	75,400	4,500	14,300	15,300	9,300	5,200	6,600	7,400	9,700	2,500
Women	10,400	900	4,500	2,900	800	500	200	200	100	100
Life scientists	350,900	23,500	71,200	74,600	56,300	34,200	29,100	25,500	21,300	13,300
Men	273,600	17,000	45,300	55,000	45,700	28,700	26,100	23,200	19,800	11,300
Women	77,300	6,500	25,900	19,700	10,600	5,500	3,000	2,300	1,600	2,000
Psychologists	144,200	15,600	24,600	29,900	26,300	16,500	11,500	9,700	6,000	3,400
Men	85,300	8,500	10,100	16,600	16,400	11,100	7,600	7,400	5,000	2,400
Women	59,000	7,100	14,500	13,300	10,000	5,400	3,900	2,200	1,000	1,000
Social scientists	256,000	23,600	55,700	49,500	45,700	27,200	18,800	12,300	12,900	7,900
Men	180,800	16,100	33,300	31,000	31,800	22,000	15,400	10,200	11,800	7,000
Women	75,200	7,500	22,400	18,500	13,900	5,100	3,400	2,000	1,100	1,000
Engineers	1,839,600	124,500	240,700	262,900	263,900	214,700	217,600	170,900	211,600	121,600
Men	1,775,100	120,700	211,600	247,100	256,200	211,800	215,900	169,700	210,400	120,800
Women	64,500	3,900	29,100	15,800	7,700	2,900	1,700	1,200	1,200	800

[1] Includes experience categories listed as well as No report.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 33 - Employed scientists and engineers by field, race, and years of professional experience: 1982

Field and race	Total employed[1]	Years of professional experience: Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E[2]	3,328,500	225,800	512,600	573,900	531,000	386,500	351,100	265,900	296,800	166,300
White	3,040,000	205,300	462,300	512,700	476,800	346,300	323,900	247,300	286,100	161,600
Black	86,400	7,600	13,600	20,000	16,400	10,200	7,000	6,400	3,300	1,800
Asian	149,900	10,000	22,500	32,400	29,400	24,100	14,900	9,500	4,800	2,200
Native American	13,500	900	2,100	1,600	1,800	1,800	2,200	1,100	1,400	600
Total scientists	1,488,900	101,300	271,900	311,100	267,100	171,700	133,500	95,000	85,200	44,700
White	1,364,700	92,200	246,900	282,800	244,000	156,000	123,400	87,700	81,600	43,100
Black	46,200	3,900	7,400	9,900	9,200	5,800	3,600	3,800	1,700	900
Asian	54,800	3,900	9,800	14,200	10,500	7,600	4,400	2,700	1,200	500
Native American	5,700	400	1,200	900	400	700	1,100	300	500	200
Physical scientists	225,100	12,000	29,600	34,000	33,600	29,500	28,700	18,900	24,900	12,500
White	207,400	10,900	26,900	30,400	30,200	27,100	26,900	17,400	24,200	12,100
Black	5,700	500	800	1,200	1,000	600	400	600	400	200
Asian	9,200	500	1,100	1,700	2,200	1,500	900	800	300	200
Native American	500	(3)	100	(3)	(3)	(3)	200	(3)	100	100
Mathematical scientists	44,600	2,200	5,000	9,800	8,400	6,700	6,000	3,000	1,700	1,800
White	33,900	1,600	3,300	7,400	7,000	5,200	3,900	2,000	1,600	1,700
Black	2,700	300	100	600	300	200	700	200	100	100
Asian	6,900	200	1,200	1,700	700	1,200	1,100	700	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	382,200	19,100	66,900	95,100	86,500	52,000	32,400	18,000	8,500	3,100
White	353,600	16,900	60,400	86,500	80,700	48,800	31,200	17,200	8,300	3,000
Black	9,500	900	1,300	2,900	1,700	1,500	400	500	100	(3)
Asian	14,200	1,100	3,600	4,700	3,100	1,100	500	100	100	(3)
Native American	1,200	(3)	100	300	200	100	400	100	(3)	(3)
Environmental scientists	85,700	5,400	18,800	18,200	10,100	5,700	6,900	7,600	9,700	2,700
White	79,700	5,100	17,900	16,300	9,300	4,900	6,600	6,800	9,700	2,500
Black	500	(3)	100	200	100	(3)	(3)	100	(3)	(3)
Asian	3,600	200	400	1,100	500	500	200	600	(3)	100
Native American	700	(3)	200	100	(3)	100	(3)	100	100	100
Life scientists	350,900	23,500	71,200	74,600	56,300	34,200	29,100	25,500	21,300	13,300
White	331,000	21,800	67,400	71,200	52,900	31,200	27,000	24,500	20,200	13,100
Black	8,100	700	1,000	1,300	1,500	1,200	900	700	700	100
Asian	8,000	600	1,200	1,300	1,600	1,600	1,000	200	200	100
Native American	1,100	100	100	200	100	200	200	(3)	200	(3)

Appendix table 33 - (cont.)

Field and race	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Psychologists	144,200	15,600	24,600	29,900	26,300	16,500	11,500	9,700	6,000	3,400
White	135,800	14,400	21,900	28,700	25,000	15,700	11,100	9,000	5,900	3,300
Black	4,800	700	1,100	900	700	300	400	600	100	(3)
Asian	1,400	100	500	100	400	100	(3)	100	(3)	(3)
Native American	900	100	400	100	100	100	(3)	(3)	(3)	100
Social scientists	256,000	23,600	55,700	49,500	45,700	27,200	18,800	12,300	12,900	7,900
White	223,400	21,400	49,100	42,200	39,000	22,900	16,600	10,800	11,800	7,400
Black	14,900	800	3,000	2,700	3,900	1,900	900	1,000	300	400
Asian	11,400	1,200	1,700	3,600	1,900	1,500	700	300	500	100
Native American	1,200	100	200	200	100	200	200	100	100	(3)
Engineers	1,839,600	124,500	240,700	262,900	263,900	214,700	217,600	170,900	211,600	121,600
White	1,675,300	113,100	215,500	229,900	232,800	190,300	200,400	159,600	204,500	118,600
Black	40,200	3,600	6,200	10,100	7,200	4,500	3,400	2,600	1,600	900
Asian	95,100	6,100	12,800	18,200	18,900	16,500	10,400	6,700	3,600	1,700
Native American	7,900	600	900	800	1,400	1,000	1,100	800	900	300

[1] Includes experience categories listed as well as No report.

[2] Includes racial categories listed as well as Other and No report.

[3] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 34 - Employed women scientists and engineers by field, race, and years of professional experience: 1982

Field and race	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E[2]	437,100	32,100	131,000	112,500	76,800	36,400	20,600	12,400	7,500	6,500
White	372,900	27,000	114,600	95,100	64,900	30,500	17,000	10,100	6,500	5,900
Black	29,600	3,000	5,800	7,900	6,000	2,800	1,400	1,800	500	400
Asian	26,200	1,700	6,600	7,800	4,500	2,800	1,600	600	400	100
Native American	1,700	100	600	500	100	100	100	(3)	100	(3)
Total scientists	372,700	28,300	101,900	96,700	69,100	33,500	18,900	11,200	6,300	5,700
White	323,900	24,200	90,600	84,300	59,500	28,900	15,500	9,000	5,400	5,400
Black	22,000	2,300	3,600	5,300	4,800	2,300	1,400	1,700	400	300
Asian	20,300	1,400	4,700	6,100	3,700	2,000	1,600	600	300	(3)
Native American	1,300	100	300	400	100	100	100	(3)	100	(3)
Physical scientists	26,300	1,400	7,300	5,500	4,000	2,700	1,800	1,500	1,200	800
White	21,300	1,100	6,400	4,300	2,800	1,900	1,400	1,300	1,100	800
Black	2,900	300	400	700	600	400	200	300	100	(3)
Asian	2,000	100	400	400	500	300	200	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	20,400	800	2,900	5,300	4,000	3,100	2,400	1,200	200	600
White	12,200	500	1,400	3,400	2,900	1,900	900	500	100	500
Black	2,100	100	100	500	300	200	400	200	100	100
Asian	5,300	200	1,000	1,300	500	1,000	800	500	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	104,100	4,100	24,400	31,600	25,800	11,300	4,200	1,600	1,100	100
White	92,300	3,000	21,600	28,100	23,500	9,900	3,800	1,400	900	100
Black	5,100	700	800	1,400	800	1,000	200	200	(3)	(3)
Asian	5,500	300	1,400	1,800	1,300	400	200	(3)	100	(3)
Native American	200	(3)	100	100	(3)	(3)	(3)	(3)	(3)	(3)
Environmental scientists	10,400	900	4,500	2,900	800	500	200	200	100	100
White	10,200	900	4,400	2,800	800	500	200	200	100	100
Black	100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Life scientists	77,300	6,500	25,900	19,700	10,600	5,500	3,000	2,300	1,600	2,000
White	72,200	5,800	24,100	18,800	9,800	5,300	2,600	2,100	1,500	2,000
Black	1,500	200	300	300	300	100	100	200	100	(3)
Asian	2,100	300	800	300	500	100	200	(3)	(3)	(3)
Native American	400	100	(3)	100	(3)	(3)	100	(3)	(3)	(3)

Appendix table 34 - (cont.)

Field and race	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Psychologists	59,000	7,100	14,500	13,300	10,000	5,400	3,900	2,200	1,000	1,000
White	54,800	6,600	13,000	12,600	9,200	5,200	3,800	2,000	1,000	1,000
Black	2,500	400	500	600	600	100	100	200	100	(3)
Asian	900	100	500	100	100	100	(3)	(3)	(3)	(3)
Native American	300	(3)	200	(3)	100	(3)	(3)	(3)	(3)	(3)
Social scientists	75,200	7,500	22,400	18,500	13,900	5,100	3,400	2,000	1,100	1,000
White	60,900	6,400	19,700	14,200	10,500	4,200	[illegible]	1,400	700	800
Black	7,800	600	1,500	[illegible]	2,200	500	400	600	100	200
Asian	4,400	500	500	2,100	800	100	200	(3)	200	(3)
Native American	400	(3)	(3)	200	(3)	100	(3)	(3)	100	(3)
Engineers	64,500	3,900	29,100	15,800	7,700	2,900	1,700	1,200	1,200	800
White	48,900	2,800	24,000	10,800	5,300	1,600	1,500	1,100	1,100	600
Black	7,600	700	2,200	2,600	1,200	500	(3)	100	100	200
Asian	5,900	300	1,900	1,800	800	800	100	(3)	(3)	100
Native American	400	(3)	300	100	100	(3)	(3)	(3)	(3)	(3)

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[1] Includes experience categories listed as well as No report.

[2] Includes racial categories listed as well as Other and No report.

[3] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 35 - Employed Hispanic scientists and engineers by field, sex, and years of professional experience: 1982

Field and sex	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	74,200	5,600	16,000	14,000	12,900	8,800	6,600	4,100	3,600	2,200
Men	62,600	4,900	11,200	11,700	11,200	7,900	5,900	3,800	3,500	2,100
Women	11,500	600	4,800	2,300	1,700	1,000	800	300	100	(2)
Total scientists	30,700	2,400	8,600	5,900	5,400	3,900	2,200	1,400	600	300
Men	21,200	1,900	4,600	4,200	4,000	3,000	1,500	1,100	500	300
Women	9,500	600	4,000	1,700	1,400	900	700	200	(2)	(2)
Physical scientists	3,800	400	600	700	1,000	100	600	100	100	200
Men	3,000	400	300	500	900	(2)	500	100	100	100
Women	800	(2)	300	100	100	100	100	(2)	(2)	(2)
Mathematical scientists	1,200	(2)	200	200	200	200	300	(2)	(2)	(2)
Men	400	(2)	100	100	100	100	100	(2)	(2)	(2)
Women	700	(2)	200	100	100	100	200	(2)	(2)	(2)
Computer specialists	5,900	400	1,400	1,200	1,000	1,300	300	100	200	(2)
Men	4,400	400	800	1,200	700	1,100	100	(2)	200	(2)
Women	1,500	(2)	600	(2)	300	200	200	100	(2)	(2)
Environmental scientists	1,500	100	500	300	100	200	100	200	100	(2)
Men	1,400	100	400	200	100	200	(2)	200	100	(2)
Women	200	(2)	100	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life scientists	6,700	300	2,000	1,400	1,000	700	500	600	100	(2)
Men	4,700	300	1,000	1,100	600	500	500	500	100	(2)
Women	2,000	(2)	1,000	300	300	200	(2)	100	(2)	(2)
Psychologists	2,700	300	1,200	400	700	100	(2)	(2)	(2)	(2)
Men	1,200	300	500	(2)	400	(2)	(2)	(2)	(2)	(2)
Women	1,500	(2)	800	400	300	100	(2)	(2)	(2)	(2)
Social scientists	8,900	1,000	2,500	1,800	1,500	1,300	300	300	100	100
Men	6,100	500	1,600	1,100	1,200	1,100	300	300	100	100
Women	2,800	500	1,000	600	300	200	100	100	(2)	(2)
Engineers	43,500	3,200	7,400	8,100	7,500	4,900	4,400	2,700	3,100	1,900
Men	41,500	3,100	6,600	7,500	7,300	4,800	4,400	2,700	3,000	1,900
Women	2,000	100	800	600	300	100	(2)	(2)	(2)	(2)

[1] Includes experience categories listed as well as No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 36 - Employed doctoral scientists and engineers by field, sex, and years of professional experience: 1981

Field and sex	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	343,500	1,200	57,000	71,900	64,600	36,700	24,700	20,000	11,400	5,800
Men	302,600	800	44,100	60,700	59,000	34,000	23,100	19,200	10,900	5,500
Women	40,900	400	12,900	11,200	5,700	2,600	1,600	800	400	300
Total scientists	286,600	1,200	49,500	60,200	51,500	30,000	20,600	16,800	9,500	5,100
Men	246,400	800	36,900	49,200	45,900	27,400	19,000	15,900	9,100	4,800
Women	40,200	400	12,600	11,000	5,600	2,600	1,600	800	400	300
Physical scientists	63,200	100	8,500	10,800	11,500	7,800	6,100	4,900	3,300	2,100
Men	59,400	100	7,500	9,800	11,000	7,500	5,800	4,700	3,200	2,000
Women	3,800	(3)	900	1,000	500	300	200	100	100	100
Mathematical scientists	15,600	100	2,100	2,900	3,400	1,900	1,200	700	400	300
Men	14,300	100	1,800	2,500	3,200	1,800	1,200	700	300	300
Women	1,300	(3)	300	400	200	100	(3)	(3)	(3)	(3)
Computer specialists	9,000	100	1,700	2,500	2,000	800	200	300	100	100
Men	8,300	100	1,400	2,300	2,000	800	200	300	100	100
Women	700	(3)	300	200	100	(3)	(3)	(3)	(3)	(3)
Environmental scientists	16,000	100	2,600	3,600	3,200	1,900	1,100	900	600	300
Men	15,200	100	2,300	3,300	3,000	1,800	1,100	900	600	300
Women	900	(3)	300	300	100	(3)	(3)	(3)	(3)	(3)
Life scientists	86,700	400	15,400	18,600	15,100	8,500	6,500	5,300	2,900	1,500
Men	73,500	300	11,300	15,000	13,300	7,600	5,900	5,000	2,700	1,400
Women	13,200	100	4,100	3,600	1,900	900	600	200	200	100
Psychologists	43,100	200	9,500	9,500	7,000	4,000	2,800	2,400	800	300
Men	31,200	(3)	5,500	6,500	5,300	3,200	2,500	2,100	700	200
Women	11,900	100	4,000	3,000	1,700	800	400	200	100	100
Social scientists	52,900	300	9,700	12,400	9,200	5,100	2,700	2,400	1,500	500
Men	44,500	200	7,100	9,800	8,000	4,600	2,400	2,200	1,400	500
Women	8,400	100	2,600	2,500	1,200	500	200	100	100	100
Engineers	57,000	100	7,500	11,600	13,200	6,700	4,100	3,200	1,900	600
Men	56,200	100	7,200	11,400	13,100	6,600	4,100	3,200	1,900	600
Women	800	(3)	300	200	100	(3)	(3)	(3)	(3)	(3)

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[1] Includes experience categories listed as well as No Report.

[2] Since receipt of doctorate.

[3] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation unpublished data.

Appendix table 37 - Employed doctoral scientists and engineers by field, race, and years of professional experience: 1981

Field and race	*Total employed*[1]	*Years of professional experience*[2]								
		Less than 1	*1-4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-29*	*30-34*	*35 and over*
Total S/E[3]	343,500	1,200	57,000	71,900	64,600	36,700	24,700	20,000	11,400	5,800
White	304,400	1,100	49,400	62,700	57,900	33,100	22,800	19,200	11,000	5,700
Black	4,300	(4)	1,100	1,200	400	200	200	100	100	(4)
Asian	26,900	100	5,700	6,900	5,200	2,800	1,400	500	200	(4)
Native American	2,200	(4)	300	400	700	200	200	100	100	(4)
Total scientists	286,600	1,200	49,500	60,200	51,500	30,000	20,600	16,800	9,500	5,100
White	257,800	1,100	43,900	54,100	46,700	27,300	19,000	16,100	9,200	5,000
Black	4,100	(4)	1,000	1,100	400	200	200	100	100	(4)
Asian	18,000	(4)	3,800	4,100	3,500	2,100	1,000	400	100	(4)
Native American	1,800	(4)	300	400	400	200	200	100	100	(4)
Physical scientists	63,200	100	8,500	10,800	11,500	7,800	6,100	4,900	3,300	2,100
White	55,500	100	7,000	9,300	10,000	7,100	5,500	4,700	3,200	2,100
Black	600	(4)	100	200	(4)	(4)	100	(4)	(4)	(4)
Asian	5,700	(4)	1,300	1,100	1,200	600	300	100	(4)	(4)
Native American	300	(4)	(4)	100	100	(4)	(4)	(4)	(4)	(4)
Mathematical scientists	15,600	100	2,100	2,900	3,400	1,900	1,200	700	400	300
White	13,700	(4)	1,800	2,600	3,100	1,700	1,100	700	400	300
Black	200	(4)	(4)	100	(4)	(4)	(4)	(4)	(4)	(4)
Asian	1,200	(4)	200	100	300	200	100	(4)	(4)	(4)
Native American	100	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Computer specialists	9,000	100	1,700	2,500	2,000	800	200	300	100	100
White	7,900	100	1,500	2,200	1,800	700	200	300	100	100
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	900	(4)	100	300	300	100	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Environmental scientists	16,000	100	2,600	3,600	3,200	1,900	1,100	900	600	300
White	15,000	100	2,400	3,300	3,000	1,800	1,100	900	600	300
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	700	(4)	200	200	100	100	(4)	(4)	(4)	(4)
Native American	100	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Life scientists	86,700	400	15,400	18,600	15,100	8,500	6,500	5,300	2,900	1,500
White	77,900	400	13,900	16,300	13,800	7,700	6,100	5,000	2,700	1,500
Black	1,100	(4)	200	300	100	100	(4)	(4)	(4)	(4)
Asian	6,100	(4)	1,200	1,700	1,000	700	300	100	100	(4)
Native American	500	(4)	100	100	100	100	100	(4)	100	(4)

Appendix table 37 - (cont.)

Field and race	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Psychologists	43,100	200	9,500	9,500	7,000	4,000	2,800	2,400	800	300
White	40,400	200	9,000	9,100	6,700	3,700	2,700	2,300	800	300
Black	800	(4)	300	200	100	100	(4)	(4)	(4)	(4)
Asian	600	(4)	100	200	100	100	100	(4)	(4)	(4)
Native American	500	(4)	100	(4)	100	100	(4)	(4)	(4)	(4)
Social scientists	52,900	300	9,700	12,400	9,200	5,100	2,700	2,400	1,500	500
White	47,400	300	8,400	11,300	8,300	4,500	2,400	2,300	1,500	500
Black	1,300	(4)	400	300	100	(4)	100	(4)	(4)	(4)
Asian	2,800	(4)	700	500	500	400	200	(4)	(4)	(4)
Native American	400	(4)	(4)	100	100	100	(4)	(4)	(4)	(4)
Engineers	57,000	100	7,500	11,600	13,200	6,700	4,100	3,200	1,900	600
White	46,600	(4)	5,500	8,600	11,200	5,900	3,800	3,100	1,800	600
Black	300	(4)	100	100	(4)	(4)	(4)	(4)	(4)	(4)
Asian	8,900	(4)	1,900	2,800	1,700	700	400	100	100	(4)
Native American	400	(4)	(4)	(4)	200	(4)	(4)	(4)	(4)	(4)

[1] Includes experience categories listed as well as No report.

[2] Since receipt of doctorate.

[3] Includes racial categories listed as well as Other and No report.

[4] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 38 - Employed women doctoral scientists and engineers by field, race, and years of professional experience: 1981

Field and race	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E[3]	40,900	400	12,900	11,200	5,700	2,600	1,600	800	400	300
White	36,300	400	11,500	10,000	5,200	2,400	1,500	800	400	300
Black	1,000	(4)	400	300	100	(4)	(4)	(4)	(4)	(4)
Asian	2,800	(4)	800	900	300	200	100	(4)	(4)	(4)
Native American	300	(4)	100	100	100	(4)	(4)	(4)	(4)	(4)
Total scientists	40,200	400	12,600	11,000	5,600	2,600	1,600	800	400	300
White	35,700	400	11,200	9,800	5,100	2,300	1,500	800	400	300
Black	1,000	(4)	400	300	100	(4)	(4)	(4)	(4)	(4)
Asian	2,700	(4)	800	800	300	200	100	(4)	(4)	(4)
Native American	300	(4)	100	100	100	(4)	(4)	(4)	(4)	(4)
Physical scientists	3,800	(4)	900	1,000	500	300	200	100	100	100
White	3,000	(4)	700	700	500	200	200	100	100	100
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	600	(4)	200	200	100	(4)	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Mathematical scientists	1,300	(4)	300	400	200	100	(4)	(4)	(4)	(4)
White	1,100	(4)	300	300	200	100	(4)	(4)	(4)	(4)
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	200	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Computer specialists	700	(4)	300	200	100	(4)	(4)	(4)	(4)	(4)
White	600	(4)	300	200	(4)	(4)	(4)	(4)	(4)	(4)
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	100	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Environmental scientists	900	(4)	300	300	100	(4)	(4)	(4)	(4)	(4)
White	800	(4)	300	200	100	(4)	(4)	(4)	(4)	(4)
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Life scientists	13,200	100	4,100	3,600	1,900	900	600	200	200	100
White	11,500	100	3,600	3,100	1,700	800	600	200	100	100
Black	300	(4)	100	100	(4)	(4)	(4)	(4)	(4)	(4)
Asian	1,200	(4)	400	300	200	100	100	(4)	(4)	(4)
Native American	100	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)

Appendix table 38 - (cont.)

Field and race	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Psychologists	11,900	100	4,000	3,000	1,700	800	400	200	100	100
White	11,000	100	3,700	2,900	1,600	700	400	200	100	100
Black	400	(4)	200	100	(4)	(4)	(4)	(4)	(4)	(4)
Asian	200	(4)	100	100	(4)	(4)	(4)	(4)	(4)	(4)
Native American	100	(4)	100	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Social scientists	8,400	100	2,600	2,500	1,200	500	200	100	100	100
White	7,700	100	2,400	2,300	1,100	500	200	100	100	100
Black	300	(4)	100	100	(4)	(4)	(4)	(4)	(4)	(4)
Asian	300	(4)	100	100	(4)	(4)	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Engineers	800	(4)	300	200	100	(4)	(4)	(4)	(4)	(4)
White	600	(4)	300	200	100	(4)	(4)	(4)	(4)	(4)
Black	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Asian	100	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Native American	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)

[1] Includes experience categories listed as well as No report.

[2] Since receipt of doctorate.

[3] Includes racial categories listed as well as Other and No report.

[4] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.

SOURCE: National Science Foundation, unpublished data.

Appendix table 39 - Employed Hispanic doctoral scientists and engineers by field, sex, and years of professional experience: 1981

Field and sex	*Total employed*[1]	*Years of professional experience*[2]								
		Less than 1	*1-4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-29*	*30-34*	*35 and over*
Total S/E	4,800	100	1,100	1,300	800	500	300	100	100	(3)
Men	4,200	(3)	900	1,100	800	500	300	100	100	(3)
Women	600	(3)	200	200	100	(3)	(3)	(3)	(3)	(3)
Total scientists	4,100	100	1,000	1,100	600	500	200	100	100	(3)
Men	3,500	(3)	800	900	500	500	200	100	100	(3)
Women	600	(3)	200	200	100	(3)	(3)	(3)	(3)	(3)
Physical scientists	900	(3)	100	200	200	100	(3)	(3)	(3)	(3)
Men	800	(3)	100	200	200	100	(3)	(3)	(3)	(3)
Women	100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	200	(3)	(3)	(3)	(3)	100	(3)	(3)	(3)	(3)
Men	200	(3)	(3)	(3)	(3)	100	(3)	(3)	(3)	(3)
Women	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Men	100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Women	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Environmental scientists	100	(3)	(3)	100	(3)	(3)	(3)	(3)	(3)	(3)
Men	100	(3)	(3)	100	(3)	(3)	(3)	(3)	(3)	(3)
Women	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Life scientists	1,200	(3)	200	400	200	200	100	(3)	(3)	(3)
Men	1,000	(3)	200	300	200	200	100	(3)	(3)	(3)
Women	200	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Psychologists	600	(3)	200	100	100	100	(3)	(3)	(3)	(3)
Men	500	(3)	200	100	(3)	100	(3)	(3)	(3)	(3)
Women	100	(3)	100	100	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	900	(3)	300	100	100	100	100	(3)	(3)	(3)
Men	700	(3)	300	100	100	100	100	(3)	(3)	(3)
Women	200	(3)	100	100	(3)	(3)	(3)	(3)	(3)	(3)
Engineers	700	(3)	100	200	200	(3)	100	(3)	(3)	(3)
Men	700	(3)	100	200	200	(3)	100	(3)	(3)	(3)
Women	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

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[1] Includes experience categories listed as well as No report.

[2] Since receipt of doctorate.

[3] Too few cases to estimate.

Note: Detail may not add to totals because of rounding.
SOURCE: National Science Foundation, unpublished data.

Appendix table 40 - Reason for non - S/E employment of women and minorities

Reason for non-S/E employment	*Total non-S/E employed*	*Total*	*Men*	*Women*	*White*	*Black*	*Asian*	*Native American*	*Hispanic*
				Total S/E's -- 1982					
Total	425,600	100%	100%	100%	100%	100%	100%	100%	100%
Prefer non-S/E	113,400	26.6	25.2	32.0	27.4	18.7	18.9	21.2	15.7
Promoted out	28,800	6.7	7.9	2.3	7.0	3.1	3.4	6.1	5.2
Better pay	42,100	9.9	9.7	10.3	10.0	10.2	5.5	2.4	10.8
Location preference	16,800	3.9	3.7	4.8	3.8	6.4	3.2	(1)	8.3
S/E not available	41,200	9.7	7.7	17.2	9.1	15.2	10.8	15.7	13.1
Other/no report	184,400	43.2	45.7	33.4	42.7	46.5	58.3	54.6	46.8
				Doctoral S/E's -- 1981					
Total	19,900	100%	100%	100%	100%	100%	100%	100%	100%
Prefer non-S/E	5,000	25.1	25.1	25.0	25.1	21.1	41.0	12.6	1.6
Promoted out	2,800	14.2	15.4	7.3	14.8	20.3	3.6	(1)	11.9
Better pay	900	4.6	4.9	2.9	4.9	4.5	(1)	3.6	28.1
Location preference	400	1.9	1.8	2.5	1.9	2.4	2.7	(1)	13.2
S/E not available	1,400	7.1	6.1	12.6	7.1	7.7	5.2	2.3	5.8
Other/no report	9,400	47.2	46.7	49.7	46.2	44.0	47.5	81.5	39.3

[1] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. Total S/E data are preliminary, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 41 - Recent science and engineering bachelor's degree recipients by field of degree, sex, and labor force/employment status: 1982

Field of degree and sex	Total	Labor force	Total employed		
			Total	S/E	Non-S/E
Total S/E	444,800	423,800	398,400	240,000	158,500
Men	283,200	274,700	260,800	176,900	83,900
Women	161,700	149,200	137,600	63,100	74,600
Total science	329,900	310,900	288,800	143,100	145,700
Men	180,100	173,300	162,200	89,800	72,400
Women	149,800	137,600	126,600	53,300	73,300
Physical science	18,300	17,400	16,400	12,400	4,000
Men	13,400	12,800	12,000	8,900	3,100
Women	4,900	4,600	4,300	3,500	900
Mathematical science	20,600	19,600	18,800	13,400	5,400
Men	12,500	11,900	11,300	8,500	2,800
Women	8,200	7,700	7,500	4,900	2,600
Computer science	24,700	24,400	24,000	21,800	2,200
Men	17,300	17,200	17,100	15,100	2,000
Women	7,400	7,200	6,900	6,700	300
Environmental science	9,800	9,200	8,500	6,800	1,600
Men	7,000	6,700	6,200	5,200	1,100
Women	2,700	2,500	2,200	1,600	600
Life science	81,600	75,900	70,000	41,000	29,000
Men	43,000	40,900	38,600	23,900	14,800
Women	38,600	34,900	31,300	17,100	14,200
Psychology	56,700	53,000	49,300	12,800	36,500
Men	20,300	19,800	18,000	6,100	11,900
Women	36,500	33,200	31,300	6,700	24,600
Social science	118,200	111,400	101,900	35,000	66,900
Men	66,800	64,000	58,900	22,200	36,700
Women	51,400	47,400	43,000	12,800	30,200
Engineering	114,900	112,900	109,600	96,800	12,800
Men	103,100	101,400	98,600	87,100	11,500
Women	11,900	11,600	11,000	9,700	1,300

Note: Detail may not add to totals because of rounding. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 42 - Recent science and engineering master's degree recipients by field of degree, sex, and labor force/employment status: 1982

Field of degree and sex	Total	Labor force	Total employed: Total	Total employed: S/E	Total employed: Non-S/E
Total S/E	71,100	69,000	66,400	49,000	17,400
Men	51,500	50,200	49,100	38,000	11,100
Women	19,700	18,700	17,400	11,000	6,300
Total science	48,800	47,100	45,100	30,400	14,600
Men	31,300	30,400	29,600	20,900	8,700
Women	17,600	16,700	15,400	9,500	5,900
Physical science	4,000	3,800	3,600	2,300	1,300
Men	3,000	2,900	2,900	1,900	900
Women	900	800	800	400	400
Mathematical science	5,800	5,600	5,400	3,900	1,500
Men	3,900	3,800	3,600	2,500	1,100
Women	1,900	1,800	1,700	1,400	300
Computer science	7,900	7,800	7,800	6,700	1,100
Men	6,100	6,100	6,000	5,100	1,000
Women	1,800	1,800	1,700	1,600	100
Environmental science	2,500	2,400	2,300	2,000	300
Men	1,900	1,800	1,700	1,500	200
Women	700	600	600	500	100
Life science	11,800	11,400	11,100	8,100	3,000
Men	7,000	6,700	6,500	4,900	1,500
Women	4,900	4,700	4,600	3,200	1,500
Psychology	5,800	5,700	5,200	2,300	2,800
Men	2,500	2,500	2,500	1,200	1,200
Women	3,300	3,200	2,700	1,100	1,600
Social science	11,000	10,500	9,800	5,100	4,600
Men	6,900	6,700	6,500	3,700	2,700
Women	4,100	3,800	3,300	1,400	1,900
Engineering	22,300	21,800	21,400	18,600	2,800
Men	20,200	19,800	19,400	17,100	2,400
Women	2,100	2,000	1,900	1,500	400

Note: Detail may not add to totals because of rounding. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 43 - Recent science and engineering bachelor's degree recipients by field of degree, race, and labor force/employment status: 1982

Field of degree and race	Total	Labor force	Total employed: Total	Total employed: S/E	Total employed: Non-S/E
Total S/E[1]	444,800	423,800	398,400	240,000	158,500
White	402,000	382,400	360,500	219,400	141,100
Black	16,900	16,600	14,300	6,400	7,900
Asian	10,300	9,900	9,500	6,800	2,700
Native American	1,800	1,800	1,500	1,100	400
Total science	329,900	310,900	288,800	143,100	145,700
White	296,700	278,800	259,700	130,400	129,300
Black	14,700	14,400	12,200	4,800	7,400
Asian	6,000	5,800	5,700	3,100	2,500
Native American	1,600	1,600	1,300	900	400
Physical science	18,300	17,400	16,400	12,400	4,000
White	16,900	16,000	15,200	11,800	3,400
Black	800	800	700	300	300
Asian	200	200	200	100	100
Native American	(2)	(2)	(2)	(2)	(2)
Mathematical science	20,600	19,600	18,800	13,400	5,400
White	18,600	17,700	17,000	12,100	4,800
Black	1,000	1,000	1,000	600	400
Asian	500	500	500	300	200
Native American	100	(2)	(2)	(2)	(2)
Computer science	24,700	24,400	24,000	21,800	2,200
White	22,400	22,100	21,800	19,900	1,900
Black	800	700	700	600	100
Asian	1,100	1,100	1,100	1,000	100
Native American	(2)	(2)	(2)	(2)	(2)
Environmental science	9,800	9,200	8,500	6,800	1,600
White	9,600	9,100	8,300	6,700	1,600
Black	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)

Appendix table 43 - (cont.)

Field of degree and race	*Total*	*Labor force*	*Total employed*		
			Total	*S/E*	*Non-S/E*
Life science	81,600	75,900	70,000	41,000	29,000
White	75,200	69,800	64,700	38,200	26,500
Black	1,600	1,600	1,300	700	600
Asian	1,900	1,700	1,700	700	1,000
Native American	400	400	300	100	200
Psychology	56,700	53,000	49,300	12,800	36,500
White	49,600	46,400	42,900	10,400	32,500
Black	3,700	3,400	3,300	600	2,400
Asian	700	700	700	400	300
Native American	1,000	1,000	1,000	700	300
Social science	118,200	111,400	101,900	35,000	66,900
White	104,300	97,700	89,900	31,300	58,600
Black	6,800	6,800	5,300	1,800	3,500
Asian	1,700	1,600	1,600	700	900
Native American	100	100	(2)	(2)	(2)
Engineering	114,900	112,900	109,600	96,800	12,800
White	105,200	103,600	100,800	89,000	11,800
Black	2,200	2,200	2,100	1,500	500
Asian	4,200	4,100	3,800	3,700	200
Native American	200	200	200	200	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 44 - Recent science and engineering master's degree recipients by field of degree, race, and labor force/employment status: 1982

Field of degree and race	Total	Labor force	Total employed		
			Total	S/E	Non-S/E
Total S/E[1]	71,100	69,000	66,400	49,000	17,400
White	63,100	61,300	59,200	43,500	15,700
Black	2,000	2,000	1,900	1,100	800
Asian	4,100	3,900	3,700	3,200	500
Native American	100	100	100	100	(2)
Total science	48,800	47,100	45,100	30,400	14,600
White	43,800	42,500	40,600	27,300	13,400
Black	1,600	1,600	1,600	800	800
Asian	2,000	1,800	1,800	1,500	200
Native American	100	100	100	100	(2)
Physical science	4,000	3,800	3,600	2,300	1,300
White	3,600	3,400	3,300	2,100	1,300
Black	100	100	100	100	(2)
Asian	100	100	100	100	(2)
Native American	(2)	(2)	(2)	(2)	(2)
Mathematical science	5,800	5,600	5,400	3,900	1,500
White	5,200	5,000	4,800	3,400	1,400
Black	200	200	200	100	(2)
Asian	400	400	400	300	(2)
Native American	(2)	(2)	(2)	(2)	(2)
Computer science	7,900	7,800	7,800	6,700	1,100
White	6,400	6,400	6,400	5,500	900
Black	100	100	100	100	(2)
Asian	900	900	900	800	100
Native American	(2)	(2)	(2)	(2)	(2)
Environmental science	2,500	2,400	2,300	2,000	300
White	2,400	2,300	2,100	1,900	300
Black	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)

Appendix table 44 - (cont.)

Field of degree and race	Total	Labor force	Total employed		
			Total	S/E	Non-S/E
Life science	11,800	11,400	11,100	8,100	3,000
White	11,200	10,800	10,600	7,700	2,900
Black	200	200	200	100	(2)
Asian	200	200	200	100	(2)
Native American	(2)	(2)	(2)	(2)	(2)
Psychology	5,800	5,700	5,200	2,300	2,800
White	5,200	5,100	4,600	2,100	2,500
Black	300	300	300	100	200
Asian	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)
Social science	11,000	10,500	9,800	5,100	4,600
White	9,800	9,400	8,800	4,700	4,000
Black	700	700	700	200	500
Asian	300	200	200	100	100
Native American	(2)	(2)	(2)	(2)	(2)
Engineering	22,300	21,800	21,400	18,600	2,800
White	19,200	18,800	18,600	16,200	2,400
Black	400	400	300	300	(2)
Asian	2,100	2,100	1,900	1,600	300
Native American	(2)	(2)	(2)	(2)	(2)

[1] Includes racial categories listed as well as Other and No report.

[2] Too few cases to estimate.

Note: Detail may not add to totals because of rounding. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 45 - Selected employment characteristics of scientists and engineers by field, racial/ethnic group, and sex: 1982

Field and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	94.9	95.2	93.2	2.3	2.0	4.3	87.2	88.2	80.2
White	94.8	95.0	92.8	2.1	1.9	4.0	87.2	88.2	79.9
Black	97.6	97.7	97.3	4.6	3.8	5.9	83.1	85.4	78.8
Asian	96.3	96.8	93.9	3.3	3.1	4.0	90.1	90.8	86.8
Native American	96.1	95.8	98.4	1.2	.9	3.4	82.1	81.6	85.3
Hispanic[1]	96.1	96.8	92.6	2.5	1.8	5.8	83.4	84.1	79.6
Total scientists	95.1	95.8	93.2	2.6	2.1	4.2	80.3	81.1	78.0
White	95.1	95.8	92.7	2.5	2.0	4.1	80.4	81.2	77.9
Black	97.3	96.8	97.8	4.5	3.6	5.5	75.3	75.5	75.0
Asian	94.9	95.2	94.5	3.6	3.7	3.4	83.3	83.0	83.9
Native American	96.0	94.8	(2)	1.2	1.5	(2)	75.6	74.0	(2)
Hispanic	94.3	94.9	92.9	3.2	2.0	5.7	73.2	71.7	76.6
Physical scientists	93.0	93.4	90.4	2.7	2.4	5.2	91.8	91.8	92.0
White	93.1	93.6	89.6	2.5	2.3	4.1	92.4	92.3	92.4
Black	93.1	90.3	95.9	6.3	4.7	7.7	86.0	82.9	88.9
Asian	93.4	93.7	92.5	5.2	2.9	12.6	86.0	84.6	91.2
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	87.1	88.7	(2)	6.7	6.8	(2)	84.5	82.5	(2)
Mathematical scientists	93.0	93.9	91.9	2.4	2.0	2.9	90.5	92.0	88.8
White	92.9	93.9	91.2	2.6	2.1	3.4	91.6	92.4	90.3
Black	96.6	(2)	96.2	5.1	(2)	6.5	91.2	(2)	91.5
Asian	91.1	93.0	90.6	.9	1.9	.6	90.2	88.6	90.7
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	97.7	98.9	94.5	1.1	1.1	1.3	71.2	70.9	72.0
White	97.6	98.9	94.3	1.1	1.0	1.2	71.0	70.6	72.1
Black	98.2	99.5	97.1	.8	.8	.9	69.6	70.7	68.6
Asian	98.7	99.4	97.8	1.9	1.6	2.4	77.6	81.0	72.2
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	98.1	100.0	93.0	(2)	(2)	(2)	75.5	72.9	83.1
Environmental scientists	94.1	94.6	91.1	3.0	2.6	6.2	94.1	94.2	93.2
White	94.1	94.5	90.9	3.1	2.6	6.2	94.0	94.1	93.2
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	96.1	96.0	(2)	2.0	1.8	(2)	97.5	97.8	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	95.1	(2)	(2)	(2)	(2)	(2)	89.5	(2)	(2)

Appendix table 45 - (cont.)

Field and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Life scientists	94.7	95.3	92.6	2.5	1.7	5.1	87.9	88.4	86.4
White	94.6	95.3	92.3	2.5	1.8	5.1	88.1	88.4	86.9
Black	96.4	96.4	96.4	1.9	1.2	4.9	91.4	92.1	88.4
Asian	94.8	93.9	97.2	2.1	2.0	2.6	83.1	84.2	80.0
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	93.6	93.3	94.3	4.2	2.7	7.7	78.6	76.3	83.8
Psychologists	95.4	96.6	93.8	3.1	2.8	3.6	75.3	78.4	70.8
White	95.5	96.8	93.6	3.0	2.5	3.7	76.1	79.3	71.5
Black	98.7	98.0	99.4	6.8	12.4	1.1	54.9	55.1	54.6
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	93.1	(2)	100.0	.4	(2)	.6	54.8	(2)	61.8
Social scientists	94.5	95.1	93.1	4.6	3.3	7.5	69.9	68.4	73.3
White	94.1	95.0	91.9	4.2	3.0	7.1	69.2	68.4	71.6
Black	98.9	98.5	99.2	6.6	4.3	8.6	69.7	65.7	73.5
Asian	95.0	94.2	96.3	7.3	9.6	3.6	80.8	73.5	92.3
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	95.6	98.4	90.2	4.7	1.5	11.2	65.3	61.6	73.3
Engineers	94.7	94.8	93.7	2.0	1.9	4.4	92.7	92.7	93.3
White	94.5	94.5	93.7	1.8	1.8	3.8	92.7	92.7	93.4
Black	97.9	98.4	95.9	4.6	4.0	7.1	92.1	92.7	89.6
Asian	97.1	97.5	91.9	3.1	2.9	5.9	93.9	93.7	96.9
Native American	96.3	96.4	(2)	1.3	.5	(2)	86.8	86.1	(2)
Hispanic	97.5	97.9	91.1	1.9	1.7	6.2	90.5	90.4	93.5

Appendix table 45 - (cont.)

Field and racial/ethnic group	*Under-employment rate*			*Under-utilization rate*		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*
Total S/E	1.9	1.4	5.4	4.1	3.3	9.4
White	1.8	1.3	5.4	3.9	3.2	9.2
Black	3.2	1.9	5.7	7.6	5.7	11.3
Asian	1.9	1.3	4.4	5.1	4.4	8.2
Native American	4.1	2.4	15.3	5.2	3.3	18.1
Hispanic[1]	3.4	2.8	6.8	5.8	4.6	12.2
Total scientists	3.6	2.7	6.1	6.1	4.7	10.1
White	3.4	2.6	6.0	5.8	4.5	9.9
Black	5.3	3.5	7.3	9.6	7.0	12.4
Asian	4.1	3.2	5.7	7.5	6.7	8.8
Native American	9.7	6.6	(2)	10.8	8.0	(2)
Hispanic	5.9	5.0	7.8	8.9	6.9	13.1
Physical scientists	1.1	1.0	1.6	3.8	3.4	6.7
White	1.1	1.0	1.9	3.6	3.3	5.9
Black	(2)	(2)	(2)	6.3	4.7	7.7
Asian	.2	(2)	1.1	5.4	2.9	13.6
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	3.6	3.6	(2)	10.1	10.2	(2)
Mathematical scientists	4.2	3.6	5.0	6.5	5.5	7.7
White	2.6	2.3	3.1	5.1	4.4	6.3
Black	4.2	(2)	4.2	9.1	(2)	10.5
Asian	12.5	21.6	9.7	13.2	23.1	10.2
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Computer specialists	2.1	2.2	2.0	3.2	3.2	3.2
White	2.1	2.2	1.7	3.1	3.2	2.9
Black	3.6	1.6	5.2	4.4	2.3	6.1
Asian	2.8	3.0	2.5	4.7	4.5	4.9
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Environmental scientists	1.7	1.3	4.8	4.7	3.8	10.7
White	1.7	1.2	4.8	4.7	3.8	10.8
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	2.1	2.1	(2)	4.0	3.8	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	1.4	(2)	(2)	1.4	(2)	(2)

Appendix table 45 - (cont.)

Field and racial/ethnic group	*Under-employment rate*			*Under-utilization rate*		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*
Life scientists	3.8	2.9	7.2	6.2	4.6	11.9
White	3.7	2.9	6.7	6.1	4.6	11.4
Black	2.5	1.8	5.4	4.4	3.0	10.1
Asian	6.8	4.4	13.0	8.8	6.3	15.3
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	8.4	5.7	14.4	12.2	8.2	21.0
Psychologists	6.1	4.0	9.1	9.0	6.7	12.3
White	5.5	3.4	8.8	8.4	5.7	12.2
Black	11.1	7.0	14.9	17.2	18.5	15.8
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	16.5	(2)	9.8	16.8	(2)	10.4
Social scientists	6.6	4.8	10.7	10.9	8.0	17.4
White	6.7	4.8	11.6	10.6	7.7	17.9
Black	8.5	6.6	10.3	14.6	10.6	18.0
Asian	2.7	2.0	3.7	9.8	11.4	7.1
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	7.1	6.2	9.1	11.5	7.6	19.3
Engineers	.6	.6	1.0	2.6	2.4	5.4
White	.6	.6	1.0	2.4	2.3	4.8
Black	.8	.8	.9	5.4	4.8	7.9
Asian	.6	.6	.2	3.7	3.5	6.1
Native American	(2)	(2)	(2)	1.3	.5	(2)
Hispanic	1.7	1.7	2.3	3.6	3.3	8.4

[1] Hispanics include individuals of all racial groups.

[2] Too few cases to estimate.

Note: See Technical Note for definition of various rates. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 46 - Selected employment characteristics of doctoral scientists and engineers by field, racial/ethnic group, and sex: 1981

Field and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	95.2	95.7	91.7	0.8	0.5	2.3	91.4	91.7	89.5
White	95.0	95.5	91.4	.7	.5	2.3	91.4	91.7	89.5
Black	95.1	94.9	95.8	1.4	1.4	1.4	85.2	85.7	83.5
Asian	97.4	97.9	93.7	1.0	.6	3.6	92.6	92.7	91.5
Native American	94.8	94.6	96.6	.3	.4	(2)	87.0	85.9	93.9
Hispanic[1]	97.5	97.7	96.2	1.4	1.3	2.1	90.8	92.0	81.6
Total scientists	94.7	95.2	91.6	.9	.6	2.4	91.0	91.3	89.3
White	94.5	95.0	91.3	.9	.6	2.3	91.1	91.4	89.4
Black	94.8	94.5	95.8	1.5	1.6	1.4	85.6	86.4	83.4
Asian	97.1	97.7	93.6	1.4	1.0	3.7	92.0	92.2	91.1
Native American	96.0	95.9	96.4	.4	.5	(2)	86.8	85.4	93.6
Hispanic	97.1	97.2	96.2	1.5	1.4	2.2	91.3	92.9	81.4
Physical scientists	94.1	94.5	88.4	.7	.6	2.1	90.6	90.7	88.0
White	93.5	93.9	87.3	.6	.6	2.0	90.4	90.5	87.8
Black	99.7	99.7	100.0	4.2	4.5	(2)	86.3	86.2	87.8
Asian	98.9	99.7	93.2	1.3	1.2	2.5	92.6	92.9	89.6
Native American	100.0	100.0	100.0	(2)	(2)	(2)	98.3	100.0	37.5
Hispanic	94.2	94.5	90.2	.5	.4	2.2	86.4	87.2	73.3
Mathematical scientists	95.3	95.7	91.2	.6	.6	1.4	90.5	90.4	91.3
White	95.0	95.4	90.6	.5	.5	1.4	90.6	90.5	91.0
Black	96.0	95.6	100.0	(2)	(2)	(2)	89.1	88.6	94.1
Asian	98.9	99.7	93.8	2.0	2.1	1.2	89.5	88.9	93.3
Native American	100.0	100.0	100.0	(2)	(2)	(2)	97.3	100.0	90.0
Hispanic	91.7	93.5	72.2	(2)	(2)	(2)	100.0	100.0	100.0
Computer specialists	99.9	100.0	98.6	.1	.0	.4	99.3	99.3	99.1
White	99.8	100.0	98.3	.1	.0	.5	99.2	99.2	99.0
Black	100.0	100.0	100.0	(2)	(2)	(2)	100.0	100.0	100.0
Asian	100.0	100.0	100.0	(2)	(2)	(2)	100.0	100.0	100.0
Native American	100.0	100.0	100.0	(2)	(2)	(2)	100.0	100.0	100.0
Hispanic	100.0	100.0	100.0	(2)	(2)	(2)	100.0	100.0	100.0

Appendix table 46 - (cont.)

Field and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Environmental scientists	97.1	97.2	96.4	0.6	0.5	0.9	95.6	95.6	95.5
White	97.0	97.0	96.2	.5	.5	.7	95.4	95.4	95.2
Black	100.0	100.0	100.0	(2)	(2)	(2)	95.1	93.5	100.0
Asian	100.0	100.0	100.0	2.4	2.3	4.0	99.3	99.4	97.9
Native American	100.0	100.0	100.0	(2)	(2)	(2)	100.0	100.0	100.0
Hispanic	97.9	100.0	84.2	(2)	(2)	(2)	94.3	98.4	62.5
Life scientists	93.6	94.3	90.0	1.2	.8	3.3	94.8	95.1	93.3
White	93.4	94.1	89.7	1.2	.8	3.5	94.9	95.1	93.4
Black	93.5	93.0	94.8	1.7	1.5	2.2	92.0	93.5	88.2
Asian	95.4	96.3	92.1	.7	.2	2.6	94.2	94.5	92.9
Native American	95.5	96.8	89.9	(2)	(2)	(2)	94.3	93.0	100.0
Hispanic	97.8	97.6	98.7	2.0	1.3	6.4	94.1	94.8	89.7
Psychologists	95.9	96.7	93.9	1.1	1.1	1.2	91.7	92.3	90.1
White	95.8	96.7	93.6	1.1	1.1	1.1	91.8	92.4	90.3
Black	96.6	97.2	95.9	1.0	.4	1.6	84.1	85.9	81.8
Asian	98.4	98.0	98.8	3.3	(2)	8.0	92.4	94.8	88.7
Native American	100.0	100.0	100.0	(2)	(2)	(2)	89.1	86.8	95.2
Hispanic	96.6	96.7	96.3	3.7	4.7	(2)	90.9	96.5	71.3
Social scientists	94.5	95.0	91.7	.8	.3	3.1	82.3	82.6	80.9
White	94.6	95.2	91.5	.6	.2	2.9	82.5	82.8	80.9
Black	92.1	91.1	95.7	.7	.7	.7	79.7	80.1	78.2
Asian	94.5	94.7	93.2	2.6	1.8	9.6	82.9	82.9	83.1
Native American	87.8	86.7	100.0	1.9	2.1	(2)	58.4	55.8	82.9
Hispanic	100.0	100.0	100.0	.9	1.1	(2)	88.4	89.2	84.6
Engineers	97.7	97.7	97.4	.1	.1	.5	93.3	93.2	96.9
White	97.7	97.7	97.4	.1	.1	(2)	93.3	93.2	96.2
Black	100.0	100.0	100.0	(2)	(2)	(2)	78.9	78.3	100.0
Asian	98.1	98.2	96.9	.0	(2)	3.3	93.8	93.7	100.0
Native American	89.9	89.6	100.0	(2)	(2)	(2)	88.3	87.9	100.0
Hispanic	100.0	100.0	100.0	0.6	0.6	(2)	87.9	87.7	100.0

Appendix table 46 - (cont.)

Field and racial/ethnic group	Under-employment rate			Under-utilization rate		
	Total	Men	Women	Total	Men	Women
Total S/E	0.9	0.7	2.9	1.7	1.2	5.2
White	1.0	.7	3.0	1.7	1.2	5.3
Black	1.0	.5	2.4	2.4	2.0	3.8
Asian	.5	.3	1.8	1.4	.9	5.4
Native American	2.6	3.1	(2)	2.9	3.4	(2)
Hispanic	1.1	.5	6.0	2.5	1.8	8.0
Total scientists	1.1	.8	2.9	2.0	1.4	5.3
White	1.1	.8	3.1	2.0	1.4	5.3
Black	1.0	.6	2.4	2.6	2.1	3.8
Asian	.7	.5	1.7	2.1	1.5	5.3
Native American	.7	.8	(2)	1.0	1.3	(2)
Hispanic	1.3	.6	6.1	2.8	2.0	8.1
Physical scientists	.8	.7	2.3	1.5	1.3	4.3
White	.7	.6	2.6	1.4	1.2	4.6
Black	(2)	(2)	(2)	4.2	4.5	(2)
Asian	1.3	1.3	.9	2.5	2.4	3.4
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	.1	(2)	2.2	.7	.4	4.3
Mathematical scientists	.4	.3	1.6	1.1	.9	3.0
White	.5	.3	1.9	1.0	.8	3.3
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	2.0	2.1	1.2
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	1.0	(2)	15.4	1.0	(2)	15.4
Computer specialists	1.8	1.6	4.9	1.9	1.6	5.3
White	2.0	1.7	5.7	2.0	1.7	6.2
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	1.6	(2)	(2)	1.6	(2)	(2)

pendix table 46 - (cont.)

Field and racial/ethnic group	Under-employment rate			Under-utilization rate		
	Total	Men	Women	Total	Men	Women
Environmental scientists	0.8	0.6	3.4	1.4	1.2	4.3
White	.8	.7	3.4	1.3	1.1	4.1
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	.5	.3	4.2	2.9	2.6	8.0
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	1.4	(2)	12.5	1.4	(2)	12.5
Life scientists	.7	.4	2.0	1.8	1.2	5.3
White	.7	.5	2.1	1.9	1.3	5.5
Black	(2)	(2)	(2)	1.7	1.5	2.2
Asian	.4	(2)	1.9	1.1	.2	4.5
Native American	1.3	1.6	(2)	1.3	1.6	(2)
Hispanic	2.2	.8	11.6	4.2	2.1	17.3
Psychologists	1.5	.9	3.1	2.6	2.0	4.3
White	1.5	.9	3.2	2.7	2.1	4.2
Black	2.1	1.1	3.3	3.0	1.6	4.8
Asian	(2)	(2)	(2)	3.3	(2)	8.0
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	2.1	1.8	3.1	5.6	6.3	3.1
Social scientists	1.9	1.4	4.5	2.7	1.7	7.4
White	2.0	1.5	4.5	2.6	1.7	7.3
Black	1.6	.7	4.6	2.3	1.4	5.2
Asian	.7	.2	5.1	3.3	2.0	14.3
Native American	1.4	1.5	(2)	3.3	3.6	(2)
Hispanic	.8	.6	1.4	1.6	1.7	1.4
Engineers	.2	.1	1.1	.2	.2	1.6
White	.1	.1	.5	.2	.2	.5
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	.1	(2)	4.2	.1	(2)	7.3
Native American	11.7	12.1	(2)	11.7	12.1	(2)
Hispanic	(2)	(2)	(2)	.6	.6	(2)

[1] Hispanics include individuals of all racial groups.

[2] Too few cases to estimate.

Note: See Technical Note for definition of various rates.

SOURCE: National Science Foundation, unpublished data.

Appendix table 47 - Selected employment characteristics of recent S/E bachelor's degree recipients by field of degree, racial/ethnic group, and sex: 1982

Field of degree and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	95.3	97.0	92.3	6.0	5.1	7.7	60.2	67.8	45.8
White	95.1	97.0	91.7	5.7	5.0	7.0	60.9	68.6	45.6
Black	97.7	99.5	96.4	13.9	7.4	18.2	44.0	47.3	42.5
Asian	95.9	95.7	96.3	3.8	4.8	1.9	71.3	76.8	60.9
Native American	96.4	(2)	(2)	15.1	(2)	(2)	70.5	(2)	(2)
Hispanic[1]	94.6	97.3	89.3	8.6	7.8	10.2	52.7	58.0	41.1
Total science	94.2	96.2	91.9	7.1	6.4	8.0	49.6	55.4	42.1
White	94.0	96.1	91.3	6.8	6.6	7.2	50.2	56.5	42.0
Black	97.5	100.0	96.1	15.1	6.8	19.9	39.7	39.4	39.9
Asian	96.3	95.0	97.6	2.7	5.3	(2)	55.0	55.3	54.7
Native American	95.9	(2)	(2)	16.4	(2)	(2)	66.0	(2)	(2)
Hispanic	93.6	96.7	88.8	9.4	9.0	10.1	44.9	48.8	38.0
Physical science	95.1	95.7	93.6	6.0	5.9	6.3	75.6	74.1	79.9
White	95.0	95.6	93.6	5.3	5.5	4.6	77.6	76.6	80.3
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical science	95.3	95.8	94.5	4.3	5.3	2.8	71.3	75.1	65.5
White	95.2	96.0	93.9	4.5	5.4	3.1	71.6	76.6	64.0
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer science	98.7	99.7	96.4	1.6	.8	3.4	90.7	88.6	95.9
White	98.7	99.6	96.3	1.5	.7	3.5	91.4	89.4	96.6
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Appendix table 47 - (cont.)

Field of degree and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Environmental science	94.1	95.2	91.3	8.1	6.9	11.2	80.6	82.8	74.3
White	94.2	95.4	91.2	8.1	6.9	11.3	80.3	82.6	74.0
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life science	93.0	95.3	90.5	7.8	5.7	10.3	58.6	61.8	54.7
White	92.8	95.3	90.1	7.4	5.4	9.7	59.1	62.0	55.5
Black	100.0	(2)	(2)	21.5	(2)	(2)	55.5	(2)	(2)
Asian	93.2	(2)	(2)	3.6	(2)	(2)	39.0	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	87.2	92.6	(2)	14.5	11.0	(2)	57.6	51.0	(2)
Psychology	93.4	97.5	91.1	7.0	8.9	5.8	25.9	33.7	21.4
White	93.4	98.0	90.8	7.4	9.3	6.2	24.2	31.9	19.6
Black	91.5	(2)	88.9	3.5	(2)	(2)	25.7	(2)	23.7
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	96.4	91.8	100.0	7.4	(2)	12.8	21.2	14.6	26.5
Social science	94.2	95.8	92.2	8.5	7.9	9.3	34.3	37.6	29.8
White	93.6	95.4	91.1	8.0	8.5	7.2	34.8	38.8	29.1
Black	100.0	100.0	100.0	21.9	5.3	31.3	33.3	32.9	33.6
Asian	96.1	(2)	(2)	4.1	(2)	(2)	41.3	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	95.8	99.3	87.2	8.8	11.5	1.1	50.5	58.5	30.3
Engineering	98.3	98.4	97.5	2.9	2.7	4.7	88.3	88.3	88.1
White	98.4	98.5	97.7	2.7	2.5	4.8	88.3	88.2	89.3
Black	98.6	(2)	(2)	6.1	(2)	(2)	[illegible]3.6	(2)	(2)
Asian	95.4	96.3	(2)	5.4	4.5	(2)	95.3	95.3	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	99.6	99.5	(2)	4.6	3.9	(2)	87.[illegible]	86.0	(2)

Appendix table 47 - (cont.)

Field of degree and racial/ethnic group	*Underemployment rate*			*Underutilization rate*		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*
Total S/E	9.0	6.5	13.7	14.4	11.2	20.4
White	8.5	6.2	13.1	13.8	11.0	19.2
Black	16.5	12.4	19.7	28.1	18.8	34.3
Asian	8.8	3.3	19.2	12.3	7.9	20.8
Native American	17.3	(2)	(2)	29.8	(2)	(2)
Hispanic	16.1	15.9	16.7	23.3	22.5	25.2
Total science	11.7	9.4	14.7	18.0	15.2	21.5
White	11.2	9.1	13.9	17.3	15.0	20.1
Black	18.8	14.1	21.9	31.0	20.0	37.4
Asian	13.1	3.9	22.7	15.5	[illegible]	22.7
Native American	20.0	(2)	(2)	33.1	(2)	(2)
Hispanic	18.9	19.7	17.5	26.6	27.0	25.9
Physical science	3.4	3.9	2.0	9.2	9.6	8.1
White	3.7	4.3	2.0	8.8	9.6	5.6
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical science	6.7	6.0	7.8	10.7	10.9	10.4
White	5.7	4.1	8.1	9.9	9.2	10.9
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Computer science	1.8	1.9	1.5	3.3	2.7	4.8
White	1.4	1.6	1.0	2.9	2.3	4.4
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)

Appendix table 47 - (cont.)

Field of degree and racial/ethnic group	Underemployment rate			Underutilization rate		
	Total	Men	Women	Total	Men	Women
Environmental science	6.0	4.5	10.4	13.6	11.1	20.4
White	6.1	4.6	10.5	13.7	11.2	20.6
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Life science	12.6	11.4	13.9	19.4	16.5	22.8
White	12.2	11.7	12.8	18.6	16.4	21.3
Black	12.2	(2)	(2)	31.1	(2)	(2)
Asian	30.3	(2)	(2)	32.8	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	23.9	29.9	(2)	35.0	37.6	(2)
Psychology	17.2	15.2	18.4	23.0	22.7	23.1
White	16.4	14.0	17.8	22.6	22.1	22.9
Black	20.1	(2)	21.3	22.9	(2)	21.3
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	27.5	34.3	21.9	32.9	34.3	31.8
Social science	13.6	10.7	17.5	20.9	17.8	25.2
White	13.1	10.6	16.7	20.0	18.2	22.7
Black	23.3	12.2	31.0	40.1	16.9	53.2
Asian	1.1	(2)	(2)	5.2	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	12.5	11.6	14.[illegible]	20.2	21.8	15.6
Engineering	1.8	1.8	2.0	4.7	4.5	6.6
White	1.7	1.6	2.4	4.4	4.1	7.1
Black	3.3	(2)	(2)	9.1	(2)	(2)
Asian	2.4	2.8	(2)	7.7	7.1	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	3.9	4.2	(2)	8.3	8.0	(2)

[1] Hispanics include individuals of all racial groups.

[2] Too few cases to estimate.

Note: See Technical Note for definition of various rates. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 48 - Selected employment characteristics of recent S/E master's degree recipients by field of degree, racial/ethnic group, and sex: 1982

Field of degree and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total S/E	97.0	97.7	95.2	3.7	2.3	7.3	73.8	77.4	63.5
White	97.2	97.7	96.0	3.4	1.8	7.5	73.4	77.1	63.1
Black	97.7	(2)	(2)	2.7	(2)	(2)	59.7	(2)	(2)
Asian	95.0	99.1	(2)	5.0	5.9	(2)	85.6	84.0	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic[1]	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Total science	96.5	97.3	95.2	4.4	2.5	7.9	67.6	70.7	61.6
White	97.0	97.5	96.0	4.4	2.3	8.3	67.1	70.2	61.1
Black	97.3	(2)	(2)	1.0	(2)	(2)	51.8	(2)	(2)
Asian	91.9	(2)	(2)	2.7	(2)	(2)	88.1	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Physical science	94.9	96.1	(2)	3.0	1.2	(2)	63.2	67.2	(2)
White	95.1	95.8	(2)	2.7	.8	(2)	61.9	67.6	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical science	96.8	96.8	96.6	4.0	2.8	6.5	72.8	68.9	81.2
White	96.4	96.6	96.1	4.5	3.1	7.6	70.4	66.1	80.4
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Computer science	99.0	99.6	97.3	.6	.4	1.4	86.2	84.2	92.9
White	99.6	99.5	(2)	.4	(2)	(2)	85.3	82.3	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Appendix table 48 - (cont.)

Field of degree and racial/ethnic group	Labor force participation rate			Unemployment rate			S/E employment rate		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Environmental science	95.8	97.3	(2)	7.0	6.7	(2)	87.0	88.8	(2)
White	95.6	97.2	(2)	6.1	5.3	(2)	87.0	88.5	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Life science	95.9	95.7	96.3	2.5	2.9	1.9	73.0	76.3	68.4
White	96.4	96.2	96.6	2.3	2.7	1.6	72.9	75.8	68.7
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Psychology	98.6	98.4	98.7	9.3	1.6	15.2	45.3	50.2	40.8
White	98.4	98.[illegible]	98.6	9.6	(2)	16.6	45.0	49.4	41.1
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Social science	94.9	97.2	91.1	6.8	3.7	12.5	52.6	58.0	42.1
White	96.5	98.3	93.2	7.1	4.0	12.7	53.9	60.3	41.0
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Engineering	97.9	98.2	94.9	2.1	2.0	2.3	86.9	87.7	78.5
White	97.8	98.0	95.9	1.0	1.1	.6	87.2	88.0	78.9
Black	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Asian	97.9	99.5	(2)	7.0	7.3	(2)	83.4	82.7	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Appendix table 48 - (cont.)

Field of degree and racial/ethnic group	Underemployment rate			Underutilization rate		
	Total	Men	Women	Total	Men	Women
Total S/E	4.3	3.4	6.8	7.8	5.7	13.6
White	4.5	3.5	7.1	7.7	5.3	14.1
Black	4.2	(2)	(2)	6.8	(2)	(2)
Asian	1.4	.9	(2)	6.3	6.7	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Total science	6.0	5.3	7.4	10.2	7.7	14.7
White	6.2	5.4	7.8	10.4	7.6	15.4
Black	5.1	(2)	(2)	6.0	(2)	(2)
Asian	1.6	(2)	(2)	4.2	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Physical science	6.2	7.9	(2)	9.1	9.0	(2)
White	6.5	8.0	(2)	8.9	8.8	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Mathematical science	4.4	4.9	3.5	8.3	7.5	9.8
White	4.4	5.3	2.4	8.7	8.2	9.8
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Computer science	1.3	1.6	(2)	1.9	2.0	1.4
White	1.1	1.5	(2)	1.5	1.5	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)

Appendix table 48 - (cont.)

Field of degree and racial/ethnic group	Underemployment rate			Underutilization rate		
	Total	*Men*	*Women*	*Total*	*Men*	*Women*
Environmental science	3.4	2.5	(2)	10.2	9.0	(2)
White	3.5	2.5	(2)	9.4	7.6	(2)
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Life science	5.7	5.5	6.0	8.1	8.3	7.8
White	5.8	5.7	5.9	7.9	8.3	7.5
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Psychology	9.4	5.0	13.4	17.9	6.5	26.6
White	8.7	1.7	14.9	17.5	1.7	29.1
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Social science	9.7	8.6	12.1	15.9	11.9	23.1
White	10.6	9.5	12.8	16.9	13.1	23.9
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	(2)	(2)	(2)	(2)	(2)	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)
Engineering	.7	.6	1.9	2.7	2.6	4.2
White	.7	.5	2.1	1.7	1.6	2.7
Black	(2)	(2)	(2)	(2)	(2)	(2)
Asian	1.1	1.2	(2)	8.1	8.4	(2)
Native American	(2)	(2)	(2)	(2)	(2)	(2)
Hispanic	(2)	(2)	(2)	(2)	(2)	(2)

[1] Hispanics include individuals of all racial groups.

[2] Too few cases to estimate.

Note: See Technical Note for definition of various rates. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 49 - Average annual salaries of scientists and engineers by field, racial/ethnic group, and years of professional experience: 1982

Field and racial/ethnic group	*Total employed*[1]	*Years of professional experience*								
		Less than 1	*1-4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-29*	*30-34*	*35 and over*
Total S/E	$34,100	$28,600	$24,400	$29,700	$34,100	$37,200	$39,600	$39,700	$40,700	[illegible]
White	34,200	28,700	24,400	29,700	34,100	37,300	39,700	39,900	40,800	40,400
Black	30,100	25,100	23,500	27,700	30,400	[illegible]	36,100	35,900	35,800	32,800
Asian	34,300	29,700	26,600	31,600	35,400	37,700	38,200	38,900	39,800	41,500
Native American	34,200	22,700	25,500	28,300	36,900	39,500	38,500	32,100	40,900	(3)
Hispanic[2]	31,500	24,100	23,600	29,800	32,500	36,300	35,900	37,700	38,300	38,000
Total scientists	32,000	25,000	21,900	28,400	33,000	36,200	38,900	39,200	41,000	41,400
White	32,100	25,000	21,800	28,400	33,100	36,400	39,100	39,400	41,200	41,500
Black	28,800	24,100	20,500	25,700	[illegible]	32,500	34,900	35,100	34,900	(3)
Asian	32,500	25,800	25,000	30,400	[illegible]	35,500	37,500	40,700	38,200	(3)
Native American	32,500	(3)	27,500	26,800	(3)	(3)	39,300	(3)	(3)	(3)
Hispanic	27,900	16,700	20,400	27,900	28,200	32,500	36,700	39,500	(3)	(3)
Physical scientists	35,100	25,400	23,700	29,500	[illegible]	37,300	39,400	41,700	42,000	42,400
White	35,400	25,200	23,700	29,800	33,800	37,700	39,700	41,500	42,300	42,300
Black	28,600	(3)	21,600	23,800	27,600	[illegible]	31,500	37,200	38,500	(3)
Asian	33,100	27,900	24,100	26,400	32,400	[illegible]	36,400	49,700	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	33,100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	33,500	32,500	25,400	27,800	31,800	35,200	37,600	37,700	43,200	44,000
White	34,500	32,400	26,900	27,800	32,900	35,800	38,600	38,900	44,900	45,600
Black	31,100	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	30,300	(3)	(3)	27,900	25,600	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	24,700	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	32,700	31,500	25,200	30,600	34,500	36,400	39,100	37,500	38,200	36,700
White	32,800	33,000	25,100	30,600	34,500	36,300	39,200	37,600	38,300	36,700
Black	31,200	26,500	24,600	29,500	32,500	37,900	34,300	36,700	(3)	(3)
Asian	32,000	27,100	26,900	31,700	36,200	36,900	39,400	(3)	(3)	(3)
Native American	33,200	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	31,600	(3)	26,300	30,500	32,200	35,400	(3)	(3)	(3)	(3)
Environmental scientists	37,400	30,000	26,900	35,200	38,500	43,400	43,800	44,200	47,700	46,600
White	37,300	29,600	26,700	35,000	38,400	44,000	43,900	45,300	47,700	44,900
Black	30,300	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	38,100	(3)	(3)	36,100	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	36,800	(3)	27,500	(3)	(3)	(3)	(3)	(3)	(3)	(3)

Appendix table 49 - (cont.)

Field and racial/ethnic group	Total employed	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Life scientists	$29,200	$23,800	$18,800	$24,300	$30,100	$33,400	$37,600	$37,100	$38,000	$41,500
White	29,200	23,800	18,700	24,300	30,100	33,600	37,300	37,200	38,100	41,700
Black	27,200	(3)	17,700	22,000	26,600	26,600	33,300	35,600	35,200	(3)
Asian	29,200	19,000	16,500	24,900	33,100	34,200	34,200	(3)	(3)	(3)
Native American	29,600	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	26,200	(3)	15,500	27,400	24,200	(3)	(3)	(3)	(3)	(3)
Psychologists	29,600	20,000	19,100	26,200	30,900	34,000	36,700	37,700	40,400	35,700
White	29,700	20,100	18,800	26,200	31,100	34,300	36,700	37,700	40,400	35,800
Black	26,600	(3)	(3)	24,300	25,600	(3)	36,900	37,900	(3)	(3)
Asian	30,500	(3)	(3)	(3)	31,900	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	22,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	31,200	20,600	19,300	28,300	33,600	38,500	39,900	41,100	42,700	42,300
White	31,300	20,700	19,200	28,500	33,900	38,800	40,100	41,900	42,800	42,500
Black	28,200	(3)	18,900	24,500	29,900	36,000	(3)	(3)	(3)	(3)
Asian	35,100	(3)	(3)	31,600	37,200	39,100	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	23,900	(3)	15,200	24,000	26,300	30,900	(3)	(3)	(3)	(3)
Engineers	35,700	32,800	26,900	31,300	35,100	38,000	40,000	40,000	40,600	40,000
White	35,900	33,200	26,900	31,300	35,100	38,000	40,100	40,200	40,600	40,000
Black	31,600	26,800	26,700	29,600	31,900	34,100	37,400	37,100	36,800	30,600
Asian	35,200	32,800	27,600	32,400	35,800	38,700	38,500	38,200	40,400	40,300
Native American	35,400	(3)	23,800	30,000	38,900	40,800	37,600	33,400	41,500	(3)
Hispanic	33,800	29,300	26,500	31,000	35,300	39,100	35,600	36,900	38,700	37,500

[1] Includes experience categories listed as well as No report.

[2] Hispanics include individuals of all racial groups.

[3] Too few cases to estimate

Note: Salaries computed for full-time employed individuals. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 50 - Average annual salaries of men scientists and engineers by field, racial/ethnic group, and years of professional experience: 1982

Field and racial/ethnic group	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	$35,100	$30,500	$25,200	$30,300	$34,700	$37,700	$39,900	$40,000	$40,900	$40,500
White	35,100	30,700	25,200	30,300	34,700	37,800	40,000	40,100	40,900	40,500
Black	31,300	27,600	24,100	28,600	32,200	33,300	36,300	37,000	36,200	31,500
Asian	35,400	30,600	27,700	32,200	36,400	38,600	38,800	39,500	39,300	41,800
Native American	35,700	24,200	27,500	31,100	37,200	39,900	39,000	32,100	41,900	(3)
Hispanic[2]	32,900	25,800	25,400	30,800	33,600	37,000	36,100	37,800	38,600	38,200
Total scientists	33,600	27,500	22,900	29,100	34,100	37,100	39,500	39,800	41,600	42,100
White	33,600	27,600	22,700	29,100	34,100	37,300	39,600	39,900	41,700	42,200
Black	30,200	27,600	21,300	26,600	32,100	31,900	34,500	36,800	36,200	(3)
Asian	35,100	26,600	27,600	31,200	38,000	37,700	39,600	43,500	34,900	(3)
Native American	35,000	(3)	(3)	32,800	(3)	(3)	40,400	(3)	(3)	(3)
Hispanic	30,500	18,600	23,000	30,600	30,100	33,100	37,600	39,500	(3)	(3)
Physical scientists	36,100	26,200	24,200	30,200	34,400	38,100	39,900	42,200	42,300	42,900
White	36,200	25,000	24,200	30,400	34,400	38,400	40,100	41,800	42,600	42,800
Black	31,300	(3)	19,500	23,800	32,300	32,200	34,300	40,300	(3)	(3)
Asian	35,200	(3)	(3)	27,500	34,800	35,000	38,200	50,000	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	35,200	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	37,000	35,400	25,400	28,900	35,100	38,300	40,100	42,600	45,700	47,600
White	37,100	35,500	26,700	28,900	35,700	37,900	39,500	41,800	46,000	48,400
Black	29,600	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	38,700	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	33,900	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	33,800	33,500	25,900	31,300	35,500	37,000	39,300	37,500	38,300	36,700
White	33,900	34,300	25,700	31,300	35,500	36,900	39,300	37,600	38,300	36,700
Black	33,000	(3)	26,400	30,600	34,300	38,800	35,900	(3)	(3)	(3)
Asian	33,900	26,600	29,200	33,500	39,500	38,800	40,100	(3)	(3)	(3)
Native American	35,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	31,400	(3)	(3)	30,200	(3)	(3)	(3)	(3)	(3)	(3)
Environmental scientists	38,400	33,100	27,400	35,600	38,800	44,100	43,700	44,100	47,800	47,200
White	38,400	32,900	27,200	35,400	38,700	44,900	43,800	45,300	47,800	45,400
Black	29,900	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	38,400	(3)	(3)	[illegible]	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	[illegible]	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	37,900	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

Appendix table 50 - (cont.)

Field and racial/ethnic group	Total employed	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Life scientists	$30,500	$25,300	$19,500	$24,600	$30,700	$34,100	$38,000	$37,600	$38,600	$42,800
White	30,500	24,800	19,400	24,700	30,600	34,400	38,200	37,800	38,700	43,100
Black	28,300	(3)	(3)	22,800	27,200	26,600	(3)	(3)	35,500	(3)
Asian	32,200	(3)	22,400	25,500	37,500	34,600	34,200	(3)	(3)	(3)
Native American	33,600	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	28,300	(3)	(3)	[illegible]	(3)	(3)	(3)	(3)	(3)	(3)
Psychologists	32,100	22,800	21,500	27,500	32,400	34,800	38,300	38,300	41,600	35,700
White	32,200	23,400	21,100	27,500	32,500	35,200	38,300	37,900	41,600	35,900
Black	29,000	(3)	(3)	25,500	(3)	(3)	(3)	(3)	(3)	(3)
Asian	30,900	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	26,400	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	33,400	23,700	20,100	29,300	35,700	39,800	40,700	42,500	43,000	42,300
White	33,500	23,900	20,200	29,400	35,600	40,000	41,000	43,300	43,300	42,600
Black	30,200	(3)	(3)	25,800	35,500	(3)	(3)	(3)	(3)	(3)
Asian	37,100	(3)	(3)	29,900	41,300	41,900	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	27,600	(3)	(3)	28,400	26,500	(3)	(3)	(3)	(3)	(3)
Engineers	36,000	33,000	26,900	31,300	35,200	38,100	40,000	40,100	40,600	40,000
White	36,100	33,400	26,900	31,300	35,200	38,100	40,200	40,300	40,600	40,000
Black	32,200	27,600	26,500	29,800	32,200	34,500	37,400	37,100	36,300	30,500
Asian	35,500	33,000	27,800	32,600	35,900	39,000	38,500	38,100	40,400	40,700
Native American	36,100	(3)	25,600	29,800	39,100	40,800	37,600	33,400	41,500	(3)
Hispanic	34,000	29,600	26,700	30,900	35,400	39,300	35,700	37,000	38,700	37,500

[1] Includes experience categories listed as well as No report.

[2] Hispanics include individuals of all racial groups.

[3] Too few cases to estimate.

Note: Salaries computed for full-time employed individuals. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 51 - Average annual salaries of women scientists and engineers by field, racial/ethnic group, and years of professional experience: 1982

Field and racial/ethnic group	Total employed[1]	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	$27,100	$20,200	$21,900	$27,000	$29,800	$32,000	$34,700	$33,900	$34,800	$36,500
White	27,000	19,500	21,700	26,900	30,000	32,000	35,000	34,300	34,400	36,800
Black	27,500	22,000	22,500	26,100	27,400	33,000	35,300	32,600	(3)	(3)
Asian	28,500	25,800	23,900	29,700	29,700	29,800	32,400	(3)	(3)	(3)
Native American	24,800	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic[2]	23,100	(3)	19,200	23,800	23,800	30,400	(3)	(3)	(3)	(3)
Total scientists	26,700	19,600	20,200	26,500	29,400	32,000	34,700	34,000	34,800	36,600
White	26,700	18,900	20,100	26,500	29,800	32,000	35,100	34,700	34,400	36,500
Black	27,000	22,500	19,500	24,800	26,800	33,500	35,300	32,300	(3)	(3)
Asian	27,900	24,200	22,300	29,400	28,500	28,400	32,200	(3)	(3)	(3)
Native American	25,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	21,900	(3)	17,700	20,200	22,200	30,600	(3)	(3)	(3)	(3)
Physical scientists	26,900	19,100	22,100	25,200	26,800	28,500	30,700	35,500	36,200	(3)
White	27,300	18,700	21,700	25,700	27,600	28,800	31,700	36,500	36,600	(3)
Black	25,900	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	25,600	(3)	26,100	23,300	24,500	27,200	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	25,500	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	29,100	(3)	25,400	26,900	27,700	31,000	33,600	(3)	(3)	(3)
White	29,500	(3)	24,700	26,500	28,300	31,700	(3)	(3)	(3)	(3)
Black	31,400	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	28,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	29,500	25,200	24,000	28,900	31,900	34,200	37,600	36,500	(3)	(3)
White	29,600	24,600	24,000	28,900	32,000	33,800	37,800	37,400	(3)	(3)
Black	29,600	(3)	23,300	28,100	30,300	37,400	(3)	(3)	(3)	(3)
Asian	29,000	(3)	23,300	29,100	31,700	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	32,200	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Environmental scientists	30,100	23,700	25,100	32,800	35,200	35,900	(3)	(3)	(3)	(3)
White	30,100	23,400	25,100	32,800	35,200	35,900	(3)	(3)	(3)	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

Appendix table 51 - (cont.)

Field and racial/ethnic group	Total employed	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Life scientists	$23,500	$20,200	$17,200	$23,100	$26,900	$28,800	$33,600	$30,500	$29,700	$35,300
White	23,700	21,400	17,400	23,200	27,100	28,800	34,000	30,500	29,300	35,300
Black	21,300	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	20,700	(3)	14,000	22,400	25,500	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	19,600	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Psychologists	25,300	17,100	17,400	24,200	27,700	31,900	33,400	35,600	33,800	(3)
White	25,300	17,200	17,300	24,200	27,900	31,700	33,400	37,300	(3)	(3)
Black	23,900	(3)	(3)	23,300	24,600	(3)	(3)	(3)	(3)	(3)
Asian	30,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	18,200	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	25,200	14,600	17,600	26,200	28,600	32,500	36,000	33,900	(3)	(3)
White	24,700	14,300	17,700	26,000	28,900	33,100	35,200	33,000	(3)	(3)
Black	26,200	(3)	(3)	23,500	(3)	(3)	(3)	(3)	(3)	(3)
Asian	31,300	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	16,300	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Engineers	29,200	26,000	26,800	29,800	32,500	32,400	34,300	32,600	35,100	36,400
White	29,100	26,200	26,900	29,800	32,700	32,300	31,500	31,700	34,100	39,000
Black	29,000	(3)	26,900	28,800	30,000	(3)	(3)	(3)	(3)	(3)
Asian	30,600	(3)	26,800	31,000	35,300	33,500	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	28,000	(3)	24,900	31,600	(3)	(3)	(3)	(3)	(3)	(3)

[1] Includes experience categories listed as well as No report.

[2] Hispanics include individuals of all racial groups.

[3] Too few cases to estimate.

Note: Salaries computed for full-time employed individuals. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 52 - Average annual salaries of doctoral scientists and engineers by field, racial/ethnic group, and years of professional experience: 1981

Field and racial/ethnic group	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	$34,600	$23,800	$25,100	$30,900	$36,200	$39,200	$41,600	$43,700	$44,500	$44,100
White	34,700	23,400	24,900	30,700	36,200	39,200	41,600	43,800	44,500	44,100
Black	32,600	18,400	25,900	31,800	37,300	37,100	51,300	36,500	(3)	(3)
Asian	33,700	30,600	25,800	32,200	36,200	38,900	41,300	44,000	46,900	(3)
Native American	34,300	(3)	25,300	30,200	36,300	40,200	(3)	(3)	(3)	(3)
Hispanic[4]	33,600	(3)	26,000	31,900	39,500	38,300	43,400	(3)	(3)	(3)
Total scientists	33,500	22,900	24,000	29,700	34,900	38,200	40,600	42,800	44,000	44,300
White	33,500	23,200	24,000	29,700	34,900	38,400	40,700	42,900	44,100	44,200
Black	32,500	18,400	25,600	31,400	37,400	37,100	51,300	(3)	(3)	(3)
Asian	31,600	15,800	22,700	29,400	34,600	36,700	38,800	43,100	44,900	(3)
Native American	33,100	(3)	24,000	29,600	34,500	37,400	(3)	(3)	(3)	(3)
Hispanic	32,800	(3)	25,500	30,900	38,600	39,400	43,700	(3)	(3)	(3)
Physical scientists	36,000	30,400	25,300	31,400	35,700	39,800	41,700	43,000	44,700	46,200
White	36,400	30,500	25,500	31,600	35,700	40,000	41,700	42,900	44,700	46,200
Black	34,100	(3)	28,400	27,800	(3)	(3)	(3)	(3)	(3)	(3)
Asian	32,600	(3)	23,700	29,800	36,400	37,200	39,700	(3)	(3)	(3)
Native American	33,500	(3)	(3)	28,500	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	34,700	(3)	24,000	34,900	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	32,600	28,500	22,800	28,500	32,300	36,800	40,200	42,100	45,200	43,200
White	32,600	(3)	22,700	28,400	32,200	36,800	40,100	42,000	45,500	42,100
Black	33,400	(3)	(3)	33,400	(3)	(3)	(3)	(3)	(3)	(3)
Asian	32,300	(3)	23,000	29,200	31,400	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	32,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	34,800	(3)	28,300	32,300	36,700	40,500	49,700	48,200	(3)	(3)
White	34,900	(3)	28,100	32,100	37,000	41,400	49,700	48,300	(3)	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	34,000	(3)	29,500	33,900	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	32,200	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

Appendix table 52 - (cont.)

Field and racial/ethnic group	Total employed	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Environmental scientists	$36,600	$23,300	$26,600	$32,800	$39,800	$40,400	$44,500	$44,200	$45,900	$41,900
White	36,700	23,300	26,700	32,600	39,600	40,500	44,300	44,200	45,900	41,900
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	36,600	(3)	25,600	34,000	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	35,800	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Life scientists	32,600	19,300	21,800	28,800	34,300	38,100	40,200	43,500	43,900	44,300
White	32,900	19,500	22,000	28,900	34,400	38,200	40,300	43,700	44,000	44,200
Black	31,700	(3)	23,800	31,500	36,000	(3)	(3)	(3)	(3)	(3)
Asian	29,800	16,300	19,900	27,100	33,200	36,200	40,700	39,600	44,100	(3)
Native American	32,600	(3)	(3)	27,300	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	33,500	(3)	22,700	32,600	38,700	39,600	(3)	(3)	(3)	(3)
Psychologists	31,500	18,600	23,900	28,400	34,000	35,400	38,400	41,300	41,300	38,900
White	31,500	18,800	23,900	28,300	34,000	35,500	38,400	41,500	41,100	39,000
Black	31,500	(3)	25,000	30,500	(3)	(3)	(3)	(3)	(3)	(3)
Asian	30,100	(3)	23,500	28,800	(3)	(3)	(3)	(3)	(3)	(3)
Native American	32,800	(3)	26,100	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	30,700	(3)	27,800	25,300	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	32,400	25,500	25,100	29,400	34,400	37,500	39,500	41,400	43,600	42,300
White	32,400	25,900	25,300	29,100	34,400	37,600	39,600	41,400	43,600	42,300
Black	32,600	(3)	25,400	32,700	(3)	(3)	(3)	(3)	(3)	(3)
Asian	31,300	(3)	23,200	32,800	32,400	37,400	(3)	(3)	(3)	(3)
Native American	33,300	(3)	(3)	32,700	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	31,400	(3)	26,200	29,400	(3)	(3)	(3)	(3)	(3)	(3)
Engineers	40,300	(3)	32,000	37,400	41,400	43,500	46,600	48,700	47,200	42,700
White	40,800	(3)	32,000	37,400	41,700	43,200	46,400	49,000	47,100	42,700
Black	35,000	(3)	29,400	35,700	(3)	(3)	(3)	(3)	(3)	(3)
Asian	38,000	(3)	31,800	36,200	39,800	45,300	(3)	(3)	(3)	(3)
Native American	40,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	37,600	(3)	31,700	36,200	(3)	(3)	(3)	(3)	(3)	(3)

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[1] Includes experience categories listed as well as No report.

[2] Since receipt of doctorate.

[3] Too few cases to estimate.

[4] Hispanics include individuals of all racial groups.

Note: Salaries computed for full-time employed individuals. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 53 - Average annual salaries of men doctoral scientists and engineers by field, racial/ethnic group and years of professional experience: 1981

Field and racial/ethnic group	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	$35,600	$26,300	$26,000	$31,700	$36,800	$39,600	$42,100	$44,000	$44,800	$44,500
White	35,700	25,800	25,800	31,500	36,800	[illegible]	42,000	44,100	44,700	44,400
Black	33,800	(3)	26,800	32,200	39,100	37,500	(3)	36,600	(3)	(3)
Asian	34,600	32,700	26,700	33,100	36,700	39,300	41,800	44,400	47,800	(3)
Native American	35,500	(3)	26,100	30,800	36,900	(3)	(3)	(3)	(3)	(3)
Hispanic[4]	34,500	(3)	26,900	32,300	40,800	38,600	43,500	(3)	(3)	(3)
Total scientists	34,500	25,300	24,700	30,400	35,500	38,700	41,100	43,100	44,300	44,700
White	34,700	25,700	24,800	30,400	35,500	38,900	41,100	43,200	44,300	44,700
Black	33,700	(3)	26,500	31,800	39,100	37,500	(3)	(3)	(3)	(3)
Asian	32,600	15,500	23,400	30,300	35,100	37,000	39,300	43,600	45,700	(3)
Native American	34,400	(3)	24,200	30,300	35,200	(3)	(3)	(3)	(3)	(3)
Hispanic	33,800	(3)	26,400	31,200	40,300	39,700	(3)	(3)	(3)	(3)
Physical scientists	36,500	34,400	25,600	31,800	36,000	40,000	42,000	43,100	44,900	46,200
White	36,900	34,400	25,800	32,100	36,000	40,300	42,000	43,000	44,900	46,200
Black	34,300	(3)	28,600	27,700	(3)	(3)	(3)	(3)	(3)	(3)
Asian	33,500	(3)	24,100	30,700	36,900	37,400	(3)	(3)	(3)	(3)
Native American	33,600	(3)	(3)	28,500	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	35,200	(3)	23,900	35,300	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	33,100	(3)	23,000	28,900	32,500	37,100	40,500	42,400	45,600	43,200
White	33,100	(3)	23,000	28,800	32,500	37,000	40,400	42,400	45,800	42,100
Black	33,800	(3)	(3)	33,600	(3)	(3)	(3)	(3)	(3)	(3)
Asian	32,800	(3)	22,100	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	33,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	35,400	(3)	29,100	32,600	37,000	40,700	(3)	48,200	(3)	(3)
White	35,400	(3)	28,900	32,400	37,300	41,600	(3)	48,300	(3)	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	34,700	(3)	30,000	34,600	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	32,400	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

Appendix table 53 - (cont.)

Field and racial/ethnic group	*Total employed*	*Years of professional experience*								
		Less than 1	*1-4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-29*	*30-34*	*35 and over*
Environmental scientists	$37,100	(3)	$26,900	$33,100	$40,100	$40,400	$44,600	$44,100	$45,800	$41,800
White	37,000	(3)	27,000	33,000	39,900	40,500	44,400	44,200	45,800	41,800
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	37,600	(3)	26,700	34,300	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	35,400	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Life scientists	33,900	$19,900	22,600	29,600	35,000	38,900	40,900	43,700	44,000	44,800
White	34,100	20,400	22,700	29,800	35,000	38,900	40,800	43,900	44,100	44,700
Black	33,000	(3)	24,300	32,900	(3)	(3)	(3)	(3)	(3)	(3)
Asian	31,000	14,800	21,100	27,800	33,600	36,600	42,700	40,000	(3)	(3)
Native American	35,000	(3)	(3)	27,200	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	34,600	(3)	23,200	32,800	40,800	40,300	(3)	(3)	(3)	(3)
Psychologists	33,200	(3)	24,600	29,200	35,200	35,800	39,000	42,000	41,700	39,700
White	33,200	(3)	24,700	29,200	35,100	35,900	39,100	42,200	41,500	39,900
Black	33,200	(3)	24,500	29,000	(3)	(3)	(3)	(3)	(3)	(3)
Asian	32,400	(3)	24,100	29,700	(3)	(3)	(3)	(3)	(3)	(3)
Native American	34,000	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	32,600	(3)	30,000	24,100	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	33,400	29,900	26,300	29,900	34,800	37,900	39,800	41,800	44,100	43,200
White	33,400	29,900	26,600	29,600	34,800	38,000	40,000	41,800	44,100	43,200
Black	34,100	(3)	26,600	33,500	(3)	(3)	(3)	(3)	(3)	(3)
Asian	32,000	(3)	23,400	34,000	32,500	(3)	(3)	(3)	(3)	(3)
Native American	33,800	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	32,000	(3)	26,800	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Engineers	40,400	(3)	32,100	37,200	41,500	43,500	46,600	48,700	47,200	42,700
White	40,900	(3)	32,200	37,500	41,700	43,200	46,400	49,000	47,100	42,700
Black	35,100	(3)	(3)	35,700	(3)	(3)	(3)	(3)	(3)	(3)
Asian	38,100	(3)	31,900	36,300	39,800	45,300	(3)	(3)	(3)	(3)
Native American	40,300	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	37,700	(3)	31,700	36,200	(3)	(3)	(3)	(3)	(3)	(3)

[1] Includes experience categories listed as well as No report.

[2] Since receipt of doctorate.

[3] Too few cases to estimate.

[4] Hispanics include individuals of all racial groups.

Note: Salaries computed for full-time employed individuals. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 54 - Average annual salaries of women doctoral scientists and engineers by field, racial/ethnic group, and years of professional experience: 1981

Field and racial/ethnic group	Total employed[1]	Years of professional experience[2]								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Total S/E	$26,800	$16,800	$21,800	$26,400	$30,100	$33,200	$34,700	$37,100	$38,200	$36,500
White	26,800	16,600	21,800	26,400	30,100	33,000	34,800	37,200	38,000	36,500
Black	28,800	(3)	24,300	30,400	32,800	(3)	(3)	(3)	(3)	(3)
Asian	26,000	19,700	20,400	26,100	29,600	34,500	33,700	(3)	(3)	(3)
Native American	26,500	(3)	24,100	25,300	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic[4]	26,[illegible]00	(3)	22,000	28,700	27,000	(3)	(3)	(3)	(3)	(3)
Total scientists	26,700	16,600	21,700	26,300	30,100	33,100	34,600	37,000	38,200	36,500
White	26,700	16,500	21,700	26,300	30,100	32,900	34,800	37,100	38,000	36,500
Black	28,800	(3)	24,200	30,400	32,800	(3)	(3)	(3)	(3)	(3)
Asian	25,800	17,000	20,000	25,800	29,300	34,400	33,[illegible]00	(3)	(3)	(3)
Native American	26,500	(3)	23,800	25,100	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	26,200	(3)	21,800	28,700	27,100	(3)	(3)	(3)	(3)	(3)
Physical scientists	27,600	12,500	22,900	26,400	29,000	33,000	34,200	37,300	33,000	44,500
White	28,000	11,300	23,200	26,500	28,900	32,700	34,000	37,800	33,000	44,500
Black	31,500	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	25,400	(3)	21,400	25,600	28,800	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	27,700	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Mathematical scientists	27,000	(3)	21,900	25,700	28,300	32,600	32,600	34,600	39,900	(3)
White	26,700	(3)	21,100	25,400	28,100	32,500	32,600	34,600	40,500	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	29,400	(3)	26,900	28,900	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Computer specialists	27,500	(3)	24,500	28,900	27,200	(3)	(3)	(3)	(3)	(3)
White	27,500	(3)	24,100	26,700	27,500	(3)	(3)	(3)	(3)	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	28,500	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

Appendix table 54 - (cont.)

Field and racial/ethnic group	Total employed	Years of professional experience								
		Less than 1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35 and over
Environmental scientists	$29,200	(3)	$24,100	$28,000	$31,000	$42,700	$41,400	(3)	(3)	(3)
White	29,600	(3)	24.600	27,800	31,200	42,700	41,600	(3)	(3)	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	23,500	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Life scientists	25,700	$17,600	19,600	25,300	29,500	32,000	34,400	$39,100	$41,500	$35,300
White	25,700	17,100	19,800	25,200	29,400	31,400	34,700	39,500	42,300	35,300
Black	28,600	(3)	23,200	29,100	(3)	(3)	(3)	(3)	(3)	(3)
Asian	25,500	(3)	17,500	24,300	30,500	34,600	(3)	(3)	(3)	(3)
Native American	22,700	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	24,800	(3)	20,400	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Psychologists	26,900	16,700	22,900	26,600	30,200	33,900	33,700	34,500	37,300	35,800
White	26,800	16,800	22,700	26,400	30,100	33,700	33,700	34,500	37,300	35,800
Black	29,400	(3)	25,300	32,300	(3)	(3)	(3)	(3)	(3)	(3)
Asian	26,400	(3)	22,500	27,600	(3)	(3)	(3)	(3)	(3)	(3)
Native American	29,500	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	24,300	(3)	21,700	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Social scientists	27,100	13,800	21,900	27,300	31,800	33,700	36,200	36,100	34,300	(3)
White	27,100	14,200	21,800	27,200	31,800	33,900	36,200	36,300	33,200	(3)
Black	27,600	(3)	23,200	29,600	(3)	(3)	(3)	(3)	(3)	(3)
Asian	25,200	(3)	21,900	27,600	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	28,900	(3)	23,700	31,200	(3)	(3)	(3)	(3)	(3)	(3)
Engineers	31,500	(3)	28,500	32,200	32,800	42,100	(3)	(3)	(3)	(3)
White	31,600	(3)	28,500	32,300	32,000	41,800	(3)	(3)	(3)	(3)
Black	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Asian	31,000	(3)	27,500	31,400	(3)	(3)	(3)	(3)	(3)	(3)
Native American	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
Hispanic	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)

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[1] Includes experience categories listed as well as No report.

[2] Since receipt of doctorate.

[3] Too few cases to estimate.

[4] Hispanics include individuals of all racial groups.

Note: Salaries computed for full-time employed individuals. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 55 - Average annual salaries of recent S/E degree recipients by field of degree, degree level, and sex/race/ethnic group: 1982

Field of degree and degree level	Total employed	Men	Women	White	Black	Asian	Native American	Hispanic[1]
Total S/E								
Bachelor's	$20,700	$22,200	$17,300	$20,800	$17,300	$21,800	$17,500	$17,000
Master's	27,400	28,500	23,800	27,300	24,600	29,700	(2)	28,700
Total science								
Bachelor's	18,000	19,200	16,300	18,200	16,000	18,100	(2)	14,300
Master's	25,500	26,700	22,900	25,400	23,100	28,500	(2)	26,800
Physical science								
Bachelor's	21,600	22,400	19,400	21,700	18,800	(2)	(2)	(2)
Master's	25,900	26,000	25,400	25,700	(2)	(2)	(2)	(2)
Mathematical science								
Bachelor's	22,100	22,800	20,800	22,100	19,700	(2)	(2)	(2)
Master's	28,700	29,800	26,400	28,500	(2)	(2)	(2)	(2)
Computer science								
Bachelor's	24,900	25,500	23,500	25,000	22,500	24,900	(2)	(2)
Master's	32,700	33,200	31,100	33,400	(2)	29,900	(2)	(2)
Environmental science								
Bachelor's	21,800	22,600	18,900	21,800	(2)	(2)	(2)	(2)
Master's	30,600	30,800	29,700	30,500	(2)	(2)	(2)	(2)
Life science								
Bachelor's	15,900	16,400	15,200	15,900	(2)	13,200	(2)	13,000
Master's	19,900	20,100	19,600	20,000	(2)	(2)	(2)	(2)
Psychology								
Bachelor's	14,800	16,700	13,700	14,900	14,600	(2)	(2)	13,800
Master's	22,100	23,500	20,300	22,000	(2)	(2)	(2)	(2)
Social science								
Bachelor's	17,000	17,700	15,900	17,300	14,600	(2)	(2)	14,000
Master's	23,400	24,900	20,000	23,400	(2)	(2)	(2)	(2)
Engineering								
Bachelor's	26,500	26,400	27,400	26,500	25,500	26,300	(2)	27,900
Master's	30,900	31,000	29,800	31,000	30,600	30,600	(2)	30,800

[1] Hispanics include individuals of all racial groups.

[2] Too few cases to estimate.

Note: Salaries computed only for full-time employed individuals. Data include combined 1980 and 1981 graduating cohorts exclusive of full-time graduate students. These are preliminary data, subject to revision.

SOURCE: National Science Foundation, unpublished data.

Appendix table 56 - High school seniors by sex, racial/ethnic group, and curriculum: 1980 (Percent)

Sex/race	*Total*	*Academic*	*General*	*Vocational*
Total	100	39	37	24
Male	100	39	38	23
Female	100	38	36	26
White	100	40	37	23
Black	100	33	35	31
Hispanic	100	27	42	31

SOURCE: National Center for Education Statistics, *High School and Beyond: A National Longitudinal Study for the 1980's*, (Washington, D.C., 1981), p.3 and unpublished data.

Appendix table 57 - High school seniors taking three or more years of mathematics and science by sex, racial/ethnic group, and curriculum: 1980
(Percent)

Curriculum	*Total*	*Male*	*Female*	*White*	*Black*	*Hispanic*
MATHEMATICS						
Academic	55	63	47	55	51	47
General	22	26	18	21	30	22
Vocational	18	22	15	16	27	19
SCIENCE						
Academic	41	48	35	43	33	30
General	13	15	10	13	15	10
Vocational	9	11	7	8	12	9

SOURCE: National Center for Education Statistics, *High School and Beyond: A National Longitudinal Study for the 1980's*, (Washington, D.C., 1981), p.5 and unpublished data.

Appendix table 58 - Mathematics and science courses of high school seniors by sex and course title: 1980

(Percent)

Course	*Male*	*Female*
Algebra I	79	79
Geometry	58	55
Algebra II	51	47
Trigonometry	30	22
Calculus	10	6
Chemistry	39	35
Physics	26	14

SOURCE: National Center for Education Statistics, *High School and Beyond: A National Longitudinal Study for the 1980's*, (Washington, D.C., 1981), p.5.

Appendix table 59 - Mathematics and science courses of high school seniors by racial/ethnic group and course title: 1980

(Percent)

Course	*White*	*Black*	*Asian*	*Native American*	*Hispanic*
Algebra I	81	68	88	61	67
Geometry	60	38	79	34	39
Algebra II	50	39	76	32	38
Trigonometry	27	15	50	17	15
Calculus	8	5	22	5	4
Chemistry	39	28	59	24	26
Physics	20	19	35	17	15

SOURCE: National Center for Education Statistics, *High School and Beyond: A National Longitudinal Study for the 1980's*, (Washington, D.C., 1981), p.5.

Appendix table 60 - Changes in mean performance on the Mathematics Assessment by sex: 1978-82

	Male			*Female*		
Assessment component	*9-year olds*	*13-year olds*	*17-year olds*	*9-year olds*	*13-year olds*	*17-year olds*
Overall						
Performance (1982)	55.8%	60.4%	61.6%	56.9%	60.6%	58.9%
Change (1978-82)	+0.5%	+4.0%[1]	-0.4%	+1.4%[1]	+3.7%[1]	+0.1%
Knowledge	67.4	73.8	75.9	69.3	73.8	73.9
Change	+1.0	+4.4[1]	0.0	+1.9[1]	+4.5[1]	+0.4
Skills	50.2	57.0	61.1	51.1	58.2	58.9
Change	+0.5	+4.2[1]	+0.2	+1.2	+3.8[1]	+0.4
Understanding	41.0	60.8	63.1	41.4	60.2	60.0
Change	-1.3	+4.2[1]	-1.0	+0.4	+3.7[1]	+0.2
Applications	40.0	46.1	44.6	39.2	45.1	40.2
Change	+0.4	+2.2[1]	-1.3	+0.6	+2.3[1]	-1.1

[1] Change is significant at the 0.05 level.

SOURCE: National Assessment of Educational Progress, *The Third National Mathematics Assessment: Results, Trends and Issues*. (Report No. 13-MA-01), April 1983, pp.37-38.

Appendix table 61 - Changes in mean performance on the Mathematics Assessment by racial/ethnic group: 1978-82

Race/ethnic group and age	*Overall performance*		*Knowledge*		*Skills*		*Understanding*		*Applications*	
	Score (1982)	*Change (1978-82)*	*Score (1982)*	*Change (1978-82)*	*Score (1982)*	*Change (1978-82)*	*Score (1982)*	*Change (1978-82)*	*Score (1982)*	*Change (1978-82)*
Total										
9-year olds	56.4%	+1.0%	68.3%	+1.4%	50.6%	+0.8%	41.2%	-0.4%	39.6%	+0.5%
13-year olds	60.5	+3.9[1]	73.8	+4.5[1]	57.6	+4.0[1]	60.5	+3.9[1]	45.6	+2.2
17-year olds	60.2	-0.2	74.9	+0.2	60.0	+0.3	61.5	-0.3	42.4	-1.1
White										
9-year olds	58.8	+0.7	70.8	+1.2	53.1	+0.6	43.4	-0.8	42.4	+0.6
13-year olds	63.1	+3.2[1]	76.1	+3.9[1]	60.4	+3.4[1]	63.6	+3.6[1]	47.9	+1.6[1]
17-year olds	63.1	-0.2	77.3	0.0	63.0	+0.3	64.7	-0.1	45.5	-1.0
Black										
9-year olds	45.2	+2.1	57.8	+3.5[1]	38.7	+1.6	31.4	+0.9	27.0	-0.6
13-year olds	48.2	+6.5[1]	63.8	+8.0[1]	44.0	+6.7[1]	46.4	+5.9[1]	34.8	+4.4[1]
17-year olds	45.0	+1.3	62.6	+3.0	44.2	+1.8	44.8	-0.2	26.0	-0.2
Hispanic										
9-year olds	47.7	+1.1	58.7	0.0	43.8	+2.5	32.4	-0.2	30.5	+0.6
13-year olds	51.9	+6.5[1]	65.3	+6.3[1]	49.2	+7.2[1]	49.7	+5.9[1]	38.8	+6.0[1]
17-year olds	49.4	+0.9	66.1	+2.0	48.4	+0.5	49.7	+0.8	31.4	+0.4

[1] Change is significant at 0.05 level.

SOURCE: National Assessment of Educational Progress, *The Third National Mathematics Assessment Results, Trends, and Issues*, (Report No. 13-MA-01), April 1983, pp. 34 and 51.

Appendix table 62a - Changes in mean performance on the Science Assessment by sex: 1977-82

Assessment component	*Male*			*Female*		
	9-year olds	*13-year olds*	*17-year olds*	*9-year olds*	*13-year olds*	*17-year olds*
Inquiry						
Score (1982)	52.8%	58.5%	70.2%	52.5%	57.6%	69.1%
Change (1977-82)	-1.1%	-0.4%	-2.6%[2]	-0.9%	-0.8%	-2.4%[2]
Science-Technology-Society						
Score	60.5	59.5	68.6	59.4	55.3	65.4
Change	+3.1[2]	+0.9	-1.4	+2.6[2]	+0.3	+0.3
Content						
Score	(1)	54.7	62.7	(1)	50.2	56.9
Change		+0.3	-2.2[2]		-1.0	-1.7[2]
Attitude[3]						
Score	67.7	52.8	49.0	65.1	47.6	46.6
Change	-0.8	-2.2	-0.9	-0.4	-2.6[2]	+2.7[2]

[1] Not administered at 9-year old level.

[2] Change is significant at the 0.05 level.

[3] For 13- and 17-year olds, "attitude" refers only to "attitudes toward science classes"

SOURCE: Science Assessment and Research Project, University of Minnesota, *Images of Science*, (Minneapolis, MN: Minnesota Research and Evaluation Center), June 1983, pp.101-119.

Appendix table 62b - Changes in mean performance for males and females on the Science Assessment by race: 1977-82

	Males						*Females*					
	White			*Black*			*White*			*Black*		
Assessment component	*9-year olds*	*13-year olds*	*17-year olds*	*9-year olds*	*13-year olds*	*17-year olds*	*9-year olds*	*13-year olds*	*17-year olds*	*9-year olds*	*13-year olds*	*17-year olds*
Inquiry												
Score (1982)	55.9%	60.4%	72.8%	40.8%	48.8%	58.1%	55.3%	59.7%	71.6%	41.4%	49.3%	56.7
Change (1977-82)	-1.3%	-0.8%	-2.6%[2]	+3.4%	+0.6%	-0.1%	-1.7%	-1.1%	-2.5%[2]	+1.9%	+0.1%	-1.9%
Science-Technology-Society												
Score	62.7	61.5	71.2	50.7	50.1	55.8	61.3	57.4	67.8	51.7	46.8	54.1
Change	+3.0[2]	+0.7	-1.2	+4.4	+1.5	+0.3	+2.2	+0.4	+0.2	+4.3	-0.8	+2.0
Content												
Score	(1)	56.8	65.6	(1)	44.6	47.8	(1)	52.4	59.3	(1)	40.6	44.4
Change		-0.2	-1.7		+2.4	-1.8		-1.2	-1.6		-0.8	-1.3
Attitude[3]												
Score	68.6	52.6	48.0	64.1	53.8	53.8	66.2	47.0	45.4	61.4	50.0	54.5
Change	-1.1	-3.2[2]	-1.3	+1.4	+0.8	-0.4	-0.5	-2.6[2]	+3.0[2]	-0.2	-1.7	+2.0

[1] Not administered at 9-year old level.

[2] Change is significant at the 0.05 level.

[3] For 13 and 17-year olds, "attitude" refers only to "attitudes toward science classes"

SOURCE: Science Assessment and Research Project, University of Minnesota,
Images of Science, (Minneapolis, MN: Minnesota Research and Evaluation Center),
June 1983, pp.101-119.

Appendix table 63 - Scholastic Aptitude Test (SAT) scores for college-bound seniors by sex: 1970-83

Year	Verbal			Mathematics		
	Male	*Female*	*Total*	*Male*	*Female*	*Total*
1970	459	461	460	509	465	483
1971	454	457	455	507	466	488
1972	454	452	453	505	461	484
1973	446	443	445	502	460	481
1974	447	442	444	501	459	480
1975	437	431	434	495	449	472
1976	433	430	431	497	446	472
1977	431	427	429	497	445	470
1978	433	425	429	494	444	468
1979	431	423	427	493	443	467
1980	428	420	424	491	443	466
1981	430	418	424	492	443	466
1982	431	421	426	493	443	467
1983	430	420	425	493	445	468

Note: Scores range from 200 to 800.

SOURCE: Admissions Testing Program of the College Board, *National College-bound Seniors* (annual series).

Appendix table 64 - Scholastic Aptitude Test (SAT) scores for college - bound seniors by race/ethnic group: 1976-82

Race/ethnic group	1976		1977		1978		1979		1980		1981		1982	
	Verbal	Math	Verbal	Math	Verbal	Math	Verbal	Math	Verbal	Math	Verbal	Math	Verbal	Math
Total	431	472	429	470	429	468	427	467	424	466	424	466	426	467
White	451	493	448	489	446	485	444	483	442	482	442	483	444	483
Black	332	354	330	357	332	354	330	358	330	360	332	362	341	366
Asian	414	518	405	514	401	510	396	511	396	509	397	513	398	513
Native American	388	420	390	421	387	419	386	421	390	426	391	425	388	424
Mexican American	371	410	370	408	370	402	370	410	372	413	373	415	377	416
Puerto Rican	364	401	355	397	349	388	345	388	350	394	353	398	360	403
Other	410	458	402	457	399	450	393	447	394	449	388	447	392	449

Note: Scores range from 200 to 800.

SOURCE: Lawrence Biemiller, "Board Says Minority-Group Scores Helped Push Up Averages on SAT," *Chronicle of Higher Education*, vol.XXV, no.8, 20 October 1982, pp. 1 and 10.

Appendix table 65 - Scores for college - bound seniors on achievement tests in mathematics and science by sex and race/ethnic group: 1981

Achievment test	*All college-bound seniors*	*Male*	*Female*	*White*	*Black*	*Asian*	*Native American*	*Mexican American*	*Puerto Rican*
Mathematics level I	539	557	522	543	477	571	506	484	502
SAT-M[1]	550	573	527	556	469	567	520	486	506
Mathematics level II	654	667	630	655	574	676	604	603	635
SAT-M	643	657	615	646	547	653	595	593	609
Chemistry	571	586	545	571	503	595	535	515	553
SAT-M	615	633	583	618	520	643	576	575	575
Biology	546	568	528	546	470	566	509	489	507
SAT-M	561	593	535	563	470	605	523	510	496
Physics	595	606	548	597	515	607	569	545	546
SAT-M	638	640	618	642	542	651	604	603	576

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[1] Score on mathematics portion of the aptitude test.

Note: Scores range from 200 to 800.

SOURCE: Admission Testing Program of the College Board, *Profiles, College-Bound Seniors, 1981*, (New York: College Entrance Examination Board, 1982), pp. 13, 23-24, 33-34, 42-43, 52-53, 61-62, 71-72, 80-81, and 100-101.

Appendix table 86 - Intended area of study of college - bound seniors by sex and racial/ethnic group: 1981

Intended area of study	*Total*	*Male*	*Female*	*White*	*Black*	*Asian*	*Native American*	*Mexican American*	*Puerto Rican*
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
S/E	36.1	46.5	26.8	35.7	35.9	43.7	36.4	38.3	34.9
Biological sciences	3.3	3.4	3.2	3.4	2.1	3.8	3.3	2.6	2.9
Agriculture	1.5	2.0	1.0	1.7	0.4	0.5	1.6	1.0	0.6
Computer science	5.6	6.5	4.8	5.1	9.0	9.9	5.7	6.2	6.8
Engineering	11.8	21.5	3.2	11.4	10.9	19.8	12.0	13.8	10.0
Mathematics	1.1	1.2	1.0	1.2	0.7	1.2	0.7	0.6	0.7
Physical sciences	2.0	3.1	1.0	2.1	0.8	2.1	1.7	1.2	1.1
Social science	7.4	7.4	7.4	7.4	8.1	4.5	7.5	9.4	8.9
Psychology	3.4	1.4	5.2	3.4	3.8	1.9	3.9	3.5	3.9
Non-S/E	63.9	53.5	73.2	64.3	64.1	56.3	63.6	61.7	65.1
Health-Medicine	14.4	9.0	19.3	13.9	16.4	19.2	14.4	15.7	16.2
Business	18.5	17.6	19.4	18.3	21.7	16.3	17.5	18.0	20.9
Education	5.7	2.6	8.6	6.1	5.0	2.1	6.5	5.4	4.9
Other Non-S/E	25.3	24.3	25.9	26.0	21.0	18.7	25.2	22.6	23.1

SOURCE: Admissions Testing Program of the College-Board, *Profiles, College-Bound Seniors, 1981*, (New York: College Entrance Examinations Board, 1982), pp. 11,21,31,40,50,59,69,78, and 98.

Appendix table 67 - Graduate Record Examination (GRE) scores by sex/race and undergraduate major: 1978/79 and 1981/82

Sex/race	All S/E 1978/79	All S/E 1981/82	Physical science 1978/79	Physical science 1981/82	Mathematical science 1978/79	Mathematical science 1981/82	Engineering 1978/79	Engineering 1981/82
Men								
Verbal	495	480	514	498	510	489	465	442
Quantitative	575	589	640	635	682	670	661	658
Analytical	515	519	555	546	568	570	525	522
Women								
Verbal	500	493	534	510	498	478	497	492
Quantitative	502	530	600	598	636	631	603	653
Analytical	515	525	564	566	565	571	534	590
White								
Verbal	523	523	541	534	537	538	527	525
Quantitative	557	566	639	633	682	676	675	679
Analytical	547	552	581	580	602	621	587	599
Black								
Verbal	372	374	391	409	364	360	403	416
Quantitative	375	382	462	485	486	476	521	565
Analytical	365	393	406	436	401	414	437	473
Asian								
Verbal	486	484	495	504	476	470	459	462
Quantitative	592	606	658	651	660	670	675	676
Analytical	524	537	546	550	549	571	533	550
Native American								
Verbal	472	473	482	491	494	455	478	482
Quantitative	476	492	581	597	671	595	570	649
Analytical	471	490	523	551	553	532	505	567

Appendix table 67 - (cont.)

Sex/race	*Biological science* 1978/79	*Biological science* 1981/82	*Behavioral science* 1978/79	*Behavioral science* 1981/82	*Social science* 1978/79	*Social science* 1981/82
Men						
Verbal	485	503	506	498	452	448
Quantitative	577	581	522	530	501	508
Analytical	518	530	509	503	473	472
Women						
Verbal	500	513	509	497	457	449
Quantitative	528	553	479	484	446	449
Analytical	526	554	513	511	469	481
White						
Verbal	521	530	528	523	484	483
Quantitative	569	581	514	519	496	500
Analytical	553	565	535	531	506	510
Black						
Verbal	358	394	386	377	343	345
Quantitative	381	414	366	358	337	334
Analytical	359	410	371	386	333	367
Asian						
Verbal	494	505	503	497	453	454
Quantitative	596	596	528	534	494	511
Analytical	537	545	510	519	464	477
Native American						
Verbal	447	488	483	480	451	422
Quantitative	479	536	457	448	443	424
Analytical	456	521	468	466	455	454

Note: Scores range from 200 to 800.

SOURCE: Cheryl L. Wild, *A Summary of Data Collected From Graduate Record Examination Test-Takers During 1978-79, Data Summary Report #4* pp. 76-78 and Marlene B. Goodison, *A Summary of Data Collected From Graduate Record Examination Test-Takers During 1981-82, Data Summary Report #7*, (Princeton, N.J.: Educational Testing Service), pp.68-78.

Appendix table 68 - Graduate Record Examination (GRE) scores of Hispanics by undergraduate major and Hispanic origin: 1981/82

Undergraduate major	*Mexican American*			*Puerto Rican*			*Latin American*		
	Verbal	*Quantitative*	*Analytical*	*Verbal*	*Quantitative*	*Analytical*	*Verbal*	*Quantitative*	*Analytical*
All science and engineering	441	466	458	391	444	417	472	500	481
Physical science	465	558	508	382	520	432	476	564	523
Mathematical science	450	601	524	377	519	429	482	636	524
Engineering	476	628	536	411	602	473	475	629	531
Biological science	459	516	478	382	444	410	491	521	504
Behavioral science	440	422	439	404	397	407	473	458	463
Social science	401	403	426	359	365	392	424	422	424

Note: Scores range from 200 to 800.

SOURCE: Marlene B. Goodison, *A Summary of Data Collected From Graduate Record Examination Test-Takers During 1981-82, Data Summary Report #7*,(Princeton, N.J.: Educational Testing Service, June 1983), pp. 76-78.

Appendix table 69 - Science and engineering bachelor's/first professional degree recipients by field and sex: 1970-81

Year	Total S/E	Physical sciences[1]	Engineering	Mathematical sciences[2]	Life sciences	Social sciences[3]
			Total			
1970	264,122	21,551	44,772	29,109	52,129	116,561
1971	271,176	21,549	45,387	27,306	51,461	125,473
1972	281,228	20,887	46,003	27,250	53,484	133,604
1973	295,391	20,809	46,989	27,528	59,486	140,579
1974	305,062	21,287	43,530	26,570	68,226	145,449
1975	294,920	20,896	40,065	23,385	72,710	137,864
1976	292,174	21,559	39,114	21,749	77,301	132,451
1977	288,543	22,618	41,581	20,729	78,472	125,143
1978	288,167	23,175	47,411	19,925	77,138	120,518
1979	288,625	23,363	53,720	20,670	75,085	115,787
1980	291,983	23,661	59,240	22,686	71,617	114,779
1981	294,867	24,175	64,068	26,406	68,086	112,132
			Men			
1970	195,244	18,582	44,434	18,593	40,254	73,381
1971	198,180	18,535	45,022	17,488	39,658	77,477
1972	203,557	17,739	45,502	17,466	40,790	82,060
1973	211,552	17,688	46,409	17,543	44,916	84,996
1974	213,269	17,751	42,824	16,851	50,390	85,453
1975	201,578	17,058	39,205	14,729	51,899	78,687
1976	196,577	17,420	37,671	14,071	53,512	73,903
1977	191,090	18,067	39,495	13,241	52,863	67,424
1978	188,107	18,188	43,914	12,815	50,184	63,006
1979	186,333	18,076	48,801	13,249	47,537	58,670
1980	186,009	18,010	53,226	14,439	44,021	56,313
1981	186,425	18,195	56,951	16,672	40,610	53,997

Appendix table 69 - (cont.)

Year	Total S/E	Physical sciences[1]	Engineering	Mathematical sciences[2]	Life sciences	Social sciences[3]
			Women			
1970	68,878	2,969	338	10,516	11,875	43,180
1971	72,996	3,014	365	9,818	11,803	47,996
1972	77,671	3,148	501	9,784	12,694	51,544
1973	83,839	3,121	580	9,985	14,570	55,583
1974	91,793	3,536	706	9,719	17,836	59,996
1975	93,342	3,838	860	8,656	20,811	59,177
1976	95,597	4,139	1,443	7,678	23,789	58,548
1977	97,453	4,551	2,086	7,488	25,609	57,719
1978	100,060	4,987	3,497	7,110	26,954	57,512
1979	102,292	5,287	4,919	7,421	27,548	57,117
1980	105,974	5,651	6,014	8,247	27,596	58,466
1981	108,442	5,980	7,117	9,734	27,476	58,135

[1] Includes environmental science.

[2] Includes computer specialties.

[3] Includes psychology.

SOURCE: National Center for Education Statistics, *Earned Degrees* (annual series) and National Science Foundation.

Appendix table 70 - Science and engineering master's degree recipients by field and sex: 1970-81

Year	Total S/E	Physical sciences[1]	Engineering	Mathematical sciences[2]	Life sciences	Social sciences[3]
Total						
1970	49,318	5,948	15,597	7,107	8,590	12,076
1971	50,624	6,386	16,347	6,789	8,320	12,782
1972	53,567	6,307	16,802	7,186	8,914	14,358
1973	54,234	6,274	16,758	7,146	9,080	14,976
1974	54,175	6,087	15,393	7,116	9,605	15,974
1975	53,852	5,830	15,434	6,637	9,618	16,333
1976	54,747	5,485	16,170	6,466	9,823	16,803
1977	56,731	5,345	16,889	6,496	10,707	17,294
1978	56,237	5,576	17,015	6,421	10,711	16,514
1979	54,456	5,464	16,193	6,101	10,719	15,979
1980	54,391	5,233	16,846	6,515	10,278	15,519
1981	54,811	5,300	17,373	6,787	9,731	15,620
Men						
1970	40,741	5,101	15,425	5,298	6,374	8,543
1971	41,966	5,533	16,160	5,101	6,130	9,042
1972	44,010	5,419	16,521	5,409	6,587	10,074
1973	44,474	5,427	16,470	5,416	6,843	10,318
1974	43,630	5,200	15,031	5,323	7,195	10,881
1975	42,847	4,982	15,038	4,871	7,207	10,749
1976	42,675	4,660	15,581	4,776	7,204	10,454
1977	43,577	4,458	16,156	4,730	7,696	10,537
1978	42,547	4,630	16,144	4,704	7,485	9,584
1979	40,416	4,472	15,203	4,469	7,259	9,013
1980	40,008	4,258	15,656	4,715	6,952	8,427
1981	39,797	4,213	15,967	4,939	6,451	8,227

Appendix table 70 - (cont.)

Year	Total S/E	Physical sciences[1]	Engineering	Mathematical sciences[2]	Life sciences	Social sciences[3]
			Women			
1970	8,577	847	172	1,809	2,216	3,533
1971	8,658	853	187	1,688	2,190	3,740
1972	9,557	888	281	1,777	2,327	4,284
1973	9,760	847	288	1,730	2,237	4,658
1974	10,545	887	362	1,793	2,410	5,093
1975	11,005	848	396	1,766	2,411	5,584
1976	12,072	825	589	1,690	2,619	6,359
1977	13,154	887	733	1,766	3,011	6,757
1978	13,690	946	871	1,717	3,226	6,930
1979	14,040	992	990	1,632	3,460	6,966
1980	14,383	975	1,190	1,800	3,326	7,092
1981	15,014	1,087	1,406	1,848	3,280	7,393

[1] Includes environmental science.

[2] Includes computer specialties.

[3] Includes psychology.

SOURCE: National Center for Education Statistics, *Earned Degrees* (annual series) and National Science Foundation.

Appendix table 71 - Science and engineering doctorate recipients by field and sex: 1970-82

Year	*Total S/E*	*Physical sciences*[1]	*Engineering*	*Mathematical sciences*[2]	*Life sciences*	*Social sciences*[3]
			Total			
1970	17,743	4,403	3,434	1,225	4,165	4,516
1971	18,948	4,501	3,498	1,238	4,556	5,155
1972	19,009	4,257	3,503	1,281	4,454	5,514
1973	19,001	4,078	3,364	1,233	4,503	5,823
1974	18,313	3,765	3,147	1,211	4,304	5,886
1975	18,358	3,710	3,002	1,147	4,402	6,097
1976	17,864	3,506	2,834	1,103	4,361	6,110
1977	17,418	3,415	2,643	964	4,266	6,130
1978	17,048	3,234	2,423	959	4,369	6,063
1979	17,245	3,320	2,490	979	4,501	5,955
1980	17,199	3,149	2,479	962	4,716	5,893
1981	17,623	3,208	2,528	960	4,783	6,144
1982	17,614	3,348	2,644	940	4,840	5,842
			Men			
1970	16,117	4,160	3,419	1,148	3,627	3,763
1971	17,007	4,256	3,483	1,142	3,896	4,230
1972	16,906	3,986	3,481	1,185	3,781	4,473
1973	16,551	3,816	3,318	1,113	3,714	4,590
1974	15,706	3,496	3,114	1,096	3,524	4,476
1975	15,522	3,416	2,950	1,038	3,553	5,565
1976	14,883	3,199	2,780	890	3,508	4,506
1977	14,311	3,112	2,569	837	3,423	4,370
1978	13,735	2,926	2,370	828	3,411	4,200
1979	13,662	2,970	2,428	833	3,470	3,961
1980	13,398	2,763	2,389	846	3,566	3,834
1981	13,602	2,844	2,429	822	3,562	3,945
1982	13,479	2,840	2,520	824	3,552	3,693

Appendix table 71 - (cont.)

Year	Total S/E	Physical sciences[1]	Engineering	Mathematical sciences[2]	Life sciences	Social sciences[3]
			Women			
1970	1,626	243	15	77	538	753
1971	1,941	245	15	96	660	925
1972	2,103	271	22	96	673	1,041
1973	2,450	262	46	120	789	1,233
1974	2,007	269	33	115	780	1,410
1975	2,836	294	52	109	849	1,532
1976	2,981	307	54	113	853	1,654
1977	3,107	303	74	127	843	1,760
1978	3,313	308	53	131	958	1,863
1979	3,583	350	62	146	1,031	1,994
1980	3,801	386	90	116	1,150	2,059
1981	4,021	364	99	138	1,221	2,199
1982	4,135	458	124	116	1,288	2,149

[1] Includes environmental science.

[2] Includes computer specialties.

[3] Includes psychology.

SOURCE: National Academy of Sciences and National Science Foundation.

Appendix table 72 - Graduate degree attainment rates by sex: 1972 - 81

Bachelor's degrees		*Master's degrees*			*Bachelor's degrees*		*Doctoral degrees*		
Year	*Number*	*Year*	*Number*	*Attainment rate*	*Year*	*Number*	*Year*	*Number*	*Attainment rate*
				Men					
1970	195,244	1972	44,010	22.5%	1965	128,723	1972	16,906	13.1%
1971	198,180	1973	44,474	22.4	1966	133,989	1973	16,551	12.4
1972	203,557	1974	43,630	21.4	1967	143,847	1974	15,706	10.7
1973	211,552	1975	42,847	20.3	1968	158,711	1975	15,522	9.8
1974	213,269	1976	42,675	20.0	1969	181,323	1976	14,883	8.2
1975	201,578	1977	43,577	21.6	1970	195,244	1977	14,311	7.3
1976	196,577	1978	42,547	21.6	1971	198,180	1978	13,735	6.9
1977	191,090	1979	40,416	21.2	1972	203,557	1979	13,662	6.7
1978	188,107	1980	40,010	21.3	1973	211,552	1980	13,398	6.3
1979	186,333	1981	39,797	21.4	1974	213,269	1981	13,602	6.4
				Women					
1970	68,878	1972	9,557	13.9	1965	36,213	1972	2,103	5.8
1971	72,996	1973	9,760	13.4	1966	39,482	1973	2,450	6.2
1972	77,671	1974	10,545	13.6	1967	44,002	1974	2,607	5.9
1973	83,839	1975	11,005	13.1	1968	53,463	1975	2,836	5.3
1974	91,793	1976	12,072	13.2	1969	63,196	1976	2,981	4.7
1975	93,342	1977	13,154	14.1	1970	68,878	1977	3,107	4.5
1976	95,597	1978	13,690	14.3	1971	72,996	1978	3,313	4.5
1977	97,453	1979	14,040	14.4	1972	77,671	1979	3,583	4.6
1978	100,060	1980	14,383	14.4	1973	83,839	1980	3,801	4.5
1979	102,292	1981	15,014	14.7	1974	91,793	1981	4,021	4.3

SOURCE: National Center for Education Statistics and National Science Foundation, unpublished data.

Appendix table 73 - Parity indices for women earning doctoral degrees in science and engineering fields: 1970 and 1982

Field	PI^1	PI^2
1970		
All S/E	---	.462
Physical science	.598	.387
Mathematical science	.685	.216
Engineering	.043	.800
Life science	1.402	.581
Social science	1.815	.539
1982		
All S/E	---	.744
Physical science	.583	.714
Mathematical science	.523	.336
Engineering	.200	1.270
Life science	1.132	.930
Social science	1.566	.893

Note: Parity indices are defined as follows:

PI^1 = % women Ph.Ds in field/ % women Ph.Ds in all fields.

PI^2 = % women Ph.Ds in field/ % women BAs in field (lagged t years).

where:
t = 6 years for physical sciences and engineering
t = 7 years for life sciences and all S/E
t = 8 years for mathematical and social sciences

SOURCE: Committee on the Education and Employment of Women in Science and Engineering, National Research Council.

Appendix table 74 - Science and engineering degree recipients by field, racial/ethnic group, and degree level: 1980-81

Field	*Bachelor's*[1]	*Master's*[1]	*Doctorates*[2]
	Total		
All S/E fields	317,975	48,529	14,141
Physical sciences	23,218	4,441	2,580
Mathematical sciences	10,623	2,101	523
Computer specialties	14,343	3,239	188
Engineering	67,991	11,795	1,467
Life sciences	63,374	8,903	4,044
Psychology	40,185	7,728	3,153
Social sciences	98,241	10,322	2,186
	White		
All S/E fields	281,850	43,429	12,138
Physical sciences	21,246	4,115	2,199
Mathematical sciences	9,445	1,890	446
Computer specialties	12,565	2,818	162
Engineering	60,848	10,147	1,092
Life sciences	57,510	8,293	3,557
Psychology	34,701	7,016	2,842
Social sciences	85,535	9,150	1,840

Appendix table 74 - (cont.)

Field	*Bachelor's*[1]	*Master's*[1]	*Doctorates*[2]
		Black	
All S/E fields	18,811	1,787	316
Physical sciences	906	107	28
Mathematical sciences	584	67	9
Computer specialties	786	70	2
Engineering	2,449	260	19
Life sciences	2,649	244	61
Psychology	3,308	424	113
Social sciences	8,129	615	84
		Asian	
All S/E fields	9,007	2,130	806
Physical sciences	596	153	160
Mathematical sciences	391	97	40
Computer specialties	669	279	16
Engineering	3,066	1,079	282
Life sciences	1,801	212	181
Psychology	839	77	41
Social sciences	1,645	233	88

Appendix table 74 - (cont.)

Field	*Bachelor's*[1]	*Master's*[1]	*Doctorates*[2]
Native American			
All S/E fields	1,202	159	26
Physical sciences	65	11	1
Mathematical sciences	18	7	1
Computer specialties	21	12	--
Engineering	195	31	4
Life sciences	233	22	7
Psychology	196	32	9
Social sciences	474	44	4
Hispanic[3]			
All S/E fields	7,910	1,024	229
Physical sciences	405	55	36
Mathematical sciences	185	40	5
Computer specialties	302	60	--
Engineering	1,433	278	16
Life sciences	1,392	132	55
Psychology	1,305	179	66
Social sciences	2,888	280	51

[1] Numbers of bachelor's and master's degrees have not been adjusted to the taxonomies used by the National Science Foundation and will therefore differ from earned degree data in other NSF publications.

[2] Includes U.S. citizens and non-U.S. citizens with a permanent visa.

[3] Bachelor's and master's categories exclude Puerto Ricans.

SOURCE: National Center for Education Statistics and
National Academy of Sciences

Appendix table 75 - Major sources of graduate support of 1982 S/E doctorate recipients by field and sex

		University			
Field and sex	*Total known sources*	*Total*	*Fellowship*	*Teaching assistantship*	*Research assistantship*
All S/E	12,200	6,600	700	2,500	3,400
Men	8,900	5,100	500	1,800	2,800
Women	3,300	1,500	200	600	600
Physical science[1]	2,400	1,800	100	500	1,200
Men	2,000	1,600	100	400	1,000
Women	300	300	20	80	200
Mathematical science[2]	600	400	40	300	100
Men	500	400	30	300	80
Women	100	60	(5)	40	(5)
Life science	3,700	2,000	200	700	1,100
Men	2,700	1,500	100	500	900
Women	1,000	500	80	200	200
Social science[3]	4,400	1,700	300	900	500
Men	2,700	1,100	200	500	300
Women	1,800	600	100	300	200
Engineering	1,100	600	40	90	500
Men	1,000	600	30	80	500
Women	100	50	(5)	10	30

Appendix table 75 - (cont.)

Field and sex	*U.S. Federal*	*Self*	*Other*[4]
All S/E	2,200	2,600	800
Men	1,600	1,700	500
Women	700	900	300
Physical science[1]	300	200	300
Men	200	200	300
Women	30	40	20
Mathematical science[2]	60	80	20
Men	50	70	20
Women	(5)	20	(5)
Life science	1,100	500	200
Men	700	400	100
Women	300	100	60
Social science[3]	700	1,600	400
Men	400	900	200
Women	300	700	200
Engineering	200	200	100
Men	100	200	100
Women	(5)	(5)	(5)

[1] Includes environmental science.

[2] Includes computer science.

[3] Includes psychology.

[4] Includes National(non-U.S. Federal), business/industry, loans and other sources.

[5] Less than 20 cases.

Note: Detail may not add to totals because of rounding.

SOURCE: National Research Council, unpublished data.

Appendix table 76 - Major sources of graduate support of 1982 S/E doctorate recipients by racial/ethnic group

Source of support	*White*	*Black*	*Asian*	*Native American*	*Hispanic*
Total, known sources	11,211	238	283	36	203
U.S. Federal	2,028	57	65	5	43
University	6,159	78	143	15	80
Fellowship	653	20	16	0	21
Teaching Assistantship	2,305	30	42	4	27
Research Assistantship	3,201	28	85	11	32
Self	2,388	51	46	11	45
Other[1]	636	52	29	5	35

[1] Includes National (non-U.S. Federal), business/industry, loans, and other.

SOURCE: National Research Council, unpublished data.

Appendix table 77 - Postdoctorates in science and engineering by field and sex/race: 1973, 1979, 1981

Field	Men			Women			White		
	1973	1979	1981	1973	1979	1981	1973	1979	1981
All S/E fields	4,800	7,992	7,768	876	2,206	2,776	4,986	8,593	8,623
Scientists	4,570	7,746	7,559	876	2,187	2,766	4,785	8,408	8,463
Physical scientists	1,725	1,933	2,130	142	280	344	1,601	1,677	1,781
Mathematical scientists	75	170	121	4	7	6	73	106	124
Computer specialties	22	12	14	--	8	1	22	20	4
Environmental scientists	171	269	166	10	39	29	155	282	173
Life scientists	2,208	4,671	4,655	602	1,483	2,002	2,498	5,397	5,640
Psychologists	169	363	290	90	231	180	217	582	416
Social scientists	200	328	183	28	139	204	219	344	325
Engineers	230	246	209	--	19	10	201	185	160

Appendix table 77 - .(cont.)

Field	Black			Asian			Native American		
	1973	*1979*	*1981*	*1973*	*1979*	*1981*	*1973*	*1979*	*1981*
All S/E fields	31	66	120	535	1,155	1,545	13	68	89
Scientists	31	66	120	516	1,083	1,486	13	68	89
Physical scientists	8	15	8	218	431	597	--	8	--
Mathematical scientists	--	--	3	6	2	--	--	--	--
Computer specialties	--	--	--	--	--	--	--	--	--
Environmental scientists	--	1	--	26	25	22	--	--	--
Life scientists	23	41	82	252	524	839	13	55	53
Psychologists	--	6	11	14	--	7	--	2	36
Social scientists	--	3	16	--	101	21	--	3	--
Engineers	--	--	--	19	72	59	--	--	--

SOURCE: National Science Foundation, *Characteristics of Doctoral Scientists and Engineers in the United States*,(biennial series) and unpublished data.